SPECIAL ISSUE CONTAINING PRELIMINARY ANNOUNCEMENTS OF THE KANSAS CITY MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES, DECEMBER 28, 1925, TO JANUARY 2, 1926. EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY.

SCIENCE

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The importance of scientific thinking and of the results of scientific research in the lives of all the people are being rapidly more thoroughly appreciated in recent years. There has never been a period in which the leadership and the great responsibility

Those expecting to attend the Kansas City meeting should look up transportation and arrange for rooms at once. A list of Kansas City hotels has been published in SCIENCE for November 13th. Those who are to present papers or addresses at the meeting should send in their manuscripts for the publicity service as soon as possible.

When purchasing transportation to Kansas City be sure to secure a certificate for the meeting of the American Association for the Advancement of Science and Associated Societies, unless a round-trip ticket is purchased. On arrival at the meeting register the certificate or round-trip ticket promptly on a registration card. The validated certificate will entitle the holder to a half-fare rate for the return trip.

largely on account of mailing the preliminary announcements to all Association members. The permanent secretary suggests that, since the association pays considerable funds to the two divisions, since the annual expenses of the association have recently been somewhat greater than the corresponding annual incomes (thus acting to decrease the emergency reserve), and since the association as such can have but slight part in joint summer meetings, it may be well to hold no summer meeting in 1926. Preparations for the Kansas City meeting seem to be well in hand. It promises to be an exceptionally interesting meeting.

General Organization

The Committee of One Hundred on Scientific Research was reorganized, the membership being made up at a special conference on this subject, held at President Pupin's invitation at his home in Norfolk, Conn., July 25–26. At this conference were present President Pupin (chairman of the Committee of One Hundred), Dr. Cattell (chairman of the Executive Committee), Dr. True (secretary of the Committee of One Hundred), and the permanent secretary. The lists were referred to the members of the executive committee and were approved, after which letters of appointment were sent out over the president's signature. At the suggestion of Drs. Slosson and Cattell, and with their help, the permanent secretary recently arranged for one or more members in each state to act as an intelligence committee to send in prompt information concerning any anti-science or anti-education movements or activities that may occur in the given state. It is planned that such reports as may be sent in will be prepared for publication by Dr. Slosson and published in SCIENCE and perhaps elsewhere. In selecting state representatives, the divisions and the affiliated academies have been consulted.

Questionnaire of the Committee on Publication

With the annual dues statement sent out on October 1, was sent to each member a questionnaire concerning the proposal to inaugurate a popular journal of science under the auspices of the association, to which about 4,178 replies have thus far been received, out of about 5,900 that have been heard from by payment of dues. Favorable to the proposal are 3,110, while 828 oppose it and 240 are undecided.

Membership

During the year 1924–25 the total gain in membership was 2,077, the net gain being 1,376. At the end of the year the number of members in good standing was 13,437 and the total enrollment was 14,263. The membership in good standing was 94.2 per cent. of the total enrollment on September 30, 1925. The recent rapid influx of new members continues unabated and even accelerated and the ratio of the number of members in good standing to the total enrollment continues to increase, though slowly, of course.

Financial Affairs

The annual report of the treasurer shows that the amount now available for appropriation, aside from special funds and liabilities, is $6,930.61. This may be wholly or partially appropriated to further research, either by direct appropriation or through allotment of grants by the Committee on Grants.

The annual financial report of the permanent secretary shows that the balance in checking account and in emergency fund has been reduced during the last year. On September 30, 1924, the amount of these two items was $3,161.71 and on September 30, 1925, they amounted to only $1,688.25. The permanent secretary suggests that the emergency fund should not be allowed to be further decreased and that the policy of some slight economy be adopted for the current year or that some special effort be directed toward increasing the annual appropriable income at least as rapidly as expenditures may be increased. The printing of the preliminary announcement of the Kansas City meeting in SCIENCE will result in a material saving. If no summer meetings are held next summer, another substantial saving may be secured. On the other hand, the budget calculation shows that only $700 of the prospective income is uncared for by the proposed budget. Against this may be set the possibilities: (1) of the annual-meeting expenses being somewhat larger than predicted and (2) of the need for some extra funds to support the work of the Committee of One Hundred on Scientific Research. Special attention is called to the probability that locally raised funds for the Kansas City meeting will probably not be nearly adequate for the extra expenses of the meeting. As the years go by we find it increasingly difficult to raise local funds for the annual meetings. It appears that conventions are being more and more financed by direct taxation of those who attend, and it seems to the permanent secretary that our association might well adopt a general policy leading to or towards the employment of a registration fee for the annual meeting or some other regular method calculated to defray the extra expenses of the meeting. With some such arrangement the annual meetings may continue to be improved.

BURTON E. LIVINGSTON,
Permanent Secretary

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of science workers was as generally acknowledged as at present. With the advance and spread of education and intelligence, in large part through the agencies of books and magazines, newspapers, the radio art and that of motion pictures, as well as through educational institutions, thoughtful persons of all classes are now generally greatly concerned with the rational foundations of knowledge and progress that constitute the realm of science. According to their best knowledge and ability the people are now judging and appraising the products of the labors of the scientific specialists—in some cases with more or less fearful forebodings apparently occasioned by the pains of intellectual and moral growth and the inevitable disintegration of many older standards and régimes, but generally with enthusiastic acclaim. Science becomes exoteric, whether its votaries will or no, and the public responsibility of those who understand its various fields and disciplines is thereby enormously enhanced. A liberty to think and speak and write as honestly as one can is surely being gradually approached, but extreme conservatism is too frequently too uninformed to be dealt with by logical reasoning and it continues instinctively to resist informing treatment. The progress of science seems no longer to encounter serious resistance among the intellectual leaders—the robed and the crowned —but a new and serious resistance is nevertheless encountered, chiefly from the multitude of the less well informed. It is consequently desirable that scientific workers take special thought toward the making of the great background of science available and understandable to thoughtful people in general.

Perhaps the most obvious need in this direction may be increased understanding of every field of science by those engaged in other fields; specialization must necessarily continue and become even more pronounced, but it is very essential that scientific men and women should increasingly appreciate the methods and accomplishments and aims that characterize science as a whole. Besides good physicists and biologists and psychologists we need, especially in the present exigency, more scientific philosophers or philosophical scientists. And we greatly require the help of all who are able to present the teachings and principles of their scientific fields so as to render them understandable to non-specialists.

The American Association, especially through its great meetings, offers a ready and effective instrument for the cultivation of both a broader appreciation of science as a whole and a more thorough understanding of the respective special sciences. It offers the most logical and promising means by which all workers in science may unite in opposing any reactionary tendencies that seem to threaten the rapid continuation of scientific and rational progress.

The association aims to promote intercourse among those who are cultivating science in different parts of America, to cooperate with other scientific societies and institutions, to give a stronger and more general impulse and more systematic direction to scientific research and to procure for the labors of scientific men increased facilities and a wider usefulness. It has played a prominent rôle in the progress of science and of education in general. Invaluable to scientific men, its influence for rationality and the scientific method of thought has become inevitably incorporated into the structure of American institutions and American civilization.

The association belongs to its members, whose financial contributions make its organization and work possible, and to the numerous societies that are associated with it. Suggestions for possible improvements in association activities are heartily invited and will always be welcome.

Members are specially asked to secure new annual and life members and to be constantly on the lookout for opportunities to enlist the interest of public-spirited men who may be willing to become sustaining members or donors. The present endowment of the association is still very small (about $131,000) and the income therefrom is correspondingly limited. Many lines of activity that deserve serious attention must be neglected in these years because of the lack of adequate funds for undertaking new kinds of work. The association is the only American organization that deals with the entire field of science and education and that enjoys the support and cooperation of so large a number of individuals and scientific organizations. It offers one of the most efficient means by which funds may be directed toward the general advancement of science and the improvement of education in America. Increased membership, increased endowment and increased active, critical and constructive interest on the part of its members and the members of the associated organizations are the great present needs.

Notices and announcements about the affairs of the American Association are published from time to time in its official journal, SCIENCE. A booklet of general information concerning the organization and its work is published each year and copies may be had from the permanent Washington office or at the registration office for the meeting. Members are urged to maintain familiarity with association affairs.

A new volume of the Summarized Proceedings of the American Association is about to appear. It includes much general information about the organiza-

tion, summary reports for the last four years, an annotated list of the hundred scientific organizations that are officially associated with the association, and a Directory of Fellows and other members, corrected to June, 1925. This volume may be secured from the Washington office at a price of $2.50 to members, $3.25 to others.

The annual meetings of the association are now held in convocation week (the week in which New Year's day falls). The meeting for 1926–27 will be held at Philadelphia, December 27, 1926, to January 1, 1927; the meeting for 1927–28 will be held in Nashville; and the great quadrennial convention for 1928–29 will be held at New York City, December 27, 1928, to January 2, 1929.

COMMITTEES AND REPRESENTATIVES FOR THE KANSAS CITY MEETING

LOCAL COMMITTEE

A. Ross Hill, *general chairman.*
H. J. Waters, *vice-chairman* (deceased).
Lyle Stephenson, *vice-chairman.*
W. M. Symon, *secretary.*
J. F. Porter.
Geo. Melcher.
Albert Saeger.

CHAIRMEN OF SUBCOMMITTEES

Finance: J. F. Porter, president, Kansas City Power and Light Co.
Publicity: Lyle Stephenson, R. A. Long Building, 10th and Grand Ave.
Hotels and Housing: W. M. Symon, manager, Convention Bureau, Chamber of Commerce.
Transportation and Signs: Geo. Melcher, 226 Library Building.
Exhibits: Albert Saeger, Junior College.
Dinners and Banquets: W. M. Symon, manager, Convention Bureau, Chamber of Commerce.

LOCAL REPRESENTATIVES FOR SECTIONS OF THE ASSOCIATION AND RELATED SOCIETIES

Section A (Mathematics): U. G. Mitchell, 1313 Mass. Ave., Lawrence, Kans.
Section B (Physics): Ben F. Eyre, 306 Land Bank Building, Kansas City.
Section C (Chemistry): Herman Schlundt, University of Missouri, Columbia, Mo.
Section D (Astronomy): D. E. Haynes, University of Missouri, Columbia, Mo.
Section E (Geology and Geography): H. A. Buchler, Rolla, Mo., *chairman;* Vernon F. Marsters, 123 Railway Exchange Building, Kansas City.
Section F (Zoological Sciences): H. H. Lane, University of Kansas, Lawrence, Kans.
Section G (Botanical Sciences): Albert Saeger, Junior College, Kansas City.
Section H (Anthropology): C. A. Ellwood, University of Missouri, Columbia, Mo.
Section I (Psychology): W. A. Andrews, Kansas State Agricultural College, Manhattan, Kans.
Section K (Social and Economic Sciences): N. S. McKelvy, 1022 West 54th St., Kansas City.
Section L (Historical and Philological Sciences): Purd Wright, Public Library, Kansas City.
Section M (Engineering): J. F. Porter, Kansas City Power and Light Co., Kansas City.
Section N (Medical Sciences): W. W. Duke, 1814 Federal Reserve Bank Building, Kansas City.
Section O (Agriculture): W. A. Cochel, Central Shorthorn Breeders' Association, Hotel Baltimore, Kansas City.
Section Q (Education): George Melcher, 226 Library Building, Kansas City.
Representative at large: W. M. Symon, Convention Bureau, Chamber of Commerce, Kansas City.

All these should be addressed, care of Mr. W. M. Symon, secretary of the Local Committee, Convention Bureau, Chamber of Commerce, Kansas City, Mo.

OFFICERS OF THE ASSOCIATION FOR THE CALENDAR YEAR 1925, INCLUDING THE KANSAS CITY MEETING

President

M. I. Pupin, Columbia University, New York, N. Y.

Retiring President

J. McKeen Cattell, Garrison-on-Hudson, N. Y.

Vice-Presidents,[1] Retiring Vice-Presidents and Secretaries of the Sections

Section A (Mathematics):
Vice-President, W. H. Roever, Washington University, St. Louis, Mo.
Retiring Vice-President, J. C. Fields, University of Toronto, Toronto, Canada.
Secretary, R. C. Archibald, Brown University, Providence, R. I.

Section B (Physics):
Vice-President, H. M. Randall, University of Michigan, Ann Arbor, Mich.
Retiring Vice-President, K. T. Compton, Princeton University, Princeton, N. J.
Secretary, A. L. Hughes, Washington University, St. Louis, Mo.

Section C (Chemistry):
Vice-President, H. B. Cady, University of Kansas, Lawrence, Kans.
Retiring Vice-President, F. G. Cottrell, Fixed Nitrogen Research Laboratory, American University, Washington, D. C.
Secretary, Gerhard Dietrichson, Suite 209, 48 Massachusetts Ave., Cambridge, Mass.

Section D (Astronomy):
Vice-President, A. E. Douglass, University of Arizona, Tucson, Ariz.

[1] Vice-presidents are elected for a term of one year, from the close of one annual meeting to the close of the next following one.

Retiring Vice-President, John A. Miller, Swarthmore College, Swarthmore, Pa.

Secretary, Philip Fox, Northwestern University, Evanston, Ill.

Section E (Geology and Geography):

Vice-President, R. A. Daly, Harvard University, Cambridge, Mass.

Retiring Vice-President, W. C. Mendenhall, U. S. Geological Survey, Washington, D. C.

Secretary, G. R. Mansfield, U. S. Geological Survey, Washington, D. C.

Section F (Zoological Sciences):

Vice-President, H. S. Jennings, Johns Hopkins University, Baltimore, Md.

Retiring Vice-President, Edwin Linton, 1104 Milledge Road, Augusta, Ga.

Secretary, Geo. T. Hargitt, Syracuse University, Syracuse, N. Y.

Section G (Botanical Sciences):

Vice-President, Robert B. Wylie, University of Iowa, Iowa City, Iowa.

Retiring Vice-President, G. R. Lyman, West Virginia University, Morgantown, W. Va.

Secretary, Sam F. Trelease, Columbia University, New York, N. Y.

Section H (Anthropology):

Vice-President, C. B. Davenport, Station for Experimental Evolution, Cold Spring Harbor, N. Y.

Retiring Vice-President, E. A. Hooton, Peabody Museum, Cambridge, Mass.

Secretary, R. J. Terry, Washington University School of Medicine, St. Louis, Mo.

Section I (Psychology):

Vice-President, C. E. Seashore, University of Iowa, Iowa City, Iowa.

Retiring Vice-President, R. S. Woodworth, Columbia University, New York, N. Y.

Secretary, Frank N. Freeman, University of Chicago, Chicago, Ill.

Section K (Social and Economic Sciences):

Vice-President, F. R. Fairchild, Yale University, New Haven, Conn.

Retiring Vice-President, Thomas S. Baker, Carnegie Institute of Technology, Pittsburgh, Pa.

Secretary, F. L. Hoffman, Babson Institute, Babson Park, Mass.

Section L (Historical and Philological Sciences):[2]

Vice-President, W. A. Oldfather, University of Illinois, Urbana, Ill.

Retiring Vice-President, Louis C. Karpinski, University of Michigan, Ann Arbor, Mich.

Secretary, Frederick E. Brasch, Library of Congress, Washington, D. C.

[2] The only portion of Section L thus far organized is that dealing with the History of Science, and the Committee on History of Science functions as an interim committee for Section L. The chairman of the committee acts as vice-president and chairman for the section.

Section M (Engineering):

Vice-President, C. R. Richards, Lehigh University, Bethlehem, Pa.

Retiring Vice-President, A. E. Kennelly, Harvard University, Cambridge, Mass.

Secretary, N. H. Heck, U. S. Coast and Geodetic Survey, Washington, D. C.

Section N (Medical Sciences):

Vice-President, A. J. Carlson, University of Chicago, Chicago, Ill.

Retiring Vice-President, William G. MacCallum, Johns Hopkins University, Baltimore, Md.

Secretary, A. J. Goldfarb, College of the City of New York, New York, N. Y.

Section O (Agriculture):

Vice-President, C. V. Piper, U. S. Department of Agriculture, Washington, D. C.

Retiring Vice-President, L. R. Jones, University of Wisconsin, Madison, Wis.

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

Section Q (Education):

Vice-President, Otis W. Caldwell, Lincoln School, Columbia University, New York, N. Y.

Retiring Vice-President, L. A. Pechstein, University of Cincinnati, Cincinnati, Ohio.

Secretary, A. S. Barr, University of Wisconsin, Madison, Wis.

Permanent Secretary[3]

Burton E. Livingston, Johns Hopkins University, Baltimore, Md. (Association mail address: Smithsonian Institution Building, Washington, D. C.)

General Secretary[3]

W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.

Treasurer[3]

John L. Wirt, Carnegie Institution of Washington, Washington, D. C.

Assistant Secretary

Francis D. Murnaghan, Johns Hopkins University, Baltimore, Md.

Secretary of the Council and Program Editor

Sam F. Trelease, Columbia University, New York, N. Y.

Executive Assistant

Sam Woodley, Smithsonian Institution Building, Washington, D. C.

Auditor

R. B. Sosman, Geophysical Laboratory, Washington, D. C.

[3] The permanent secretary, the general secretary and the treasurer are each elected for a term of four years; their terms of office expire at the end of the fifth New York meeting.

Members of the Executive Committee of the Council for the Calendar Year 1925[4]

J. McK. Cattell (1926), *chairman*, Garrison-on-Hudson, N. Y.
M. I. Pupin, president of the Association (1925).
Burton E. Livingston, permanent secretary (1928).
W. J. Humphreys, general secretary (1928).
B. M. Duggar (1925), Missouri Botanical Garden, St. Louis, Mo.
Herman L. Fairchild (1927), University of Rochester, Rochester, N. Y.
Vernon L. Kellogg (1928), National Research Council, Washington, D. C.
F. R. Moulton (1925), University of Chicago, Chicago, Ill.
W. A. Noyes (1927), University of Illinois, Urbana, Ill.
Henry B. Ward (1926), University of Illinois, Urbana, Ill.
Edwin B. Wilson (1928), Harvard School of Public Health, Boston, Mass.

GENERAL FEATURES OF THE KANSAS CITY MEETING

This year's annual meeting will be the eighty-second meeting of the association. It is necessarily only infrequently that an annual meeting is held so far west as Kansas City and this will be the first in that place. It will bring the great scientific convention to a region characterized by typical American progress and prosperity, to a community of high intellectual and educational ideals, and many members and other friends of the association who dwell in the region now to be visited and who do not generally find it possible to attend the annual meetings will be able this year to receive the benefits of attending. The distance to be traveled will be relatively short from places in the Mississippi and Missouri valleys, and the facilities for transportation to Kansas City from all parts of the country are unsurpassed.

The hotel accommodations at Kansas City are exceptionally excellent. The larger hotels are conveniently grouped in a small area and the Kansas City Junior College, at which many of the sessions will be held, is situated but a short distance away. The local arrangements for the meeting are in the hands of an able committee, of which Dr. A. Ross Hill is chairman. The Convention Bureau of the Kansas City Chamber of Commerce, which is deeply appreciative of the aims of men and women of science, is giving very valuable aid to the local committee.

THE THIRD AMERICAN ASSOCIATION PRIZE

The third annual American Association prize of one thousand dollars is to be awarded at the close of the Kansas City meeting. Funds for the annual prizes were given to the association by a broad-minded and far-seeing member who desires that his name be withheld. This feature of the annual meetings greatly increases interest and enthusiasm and has already demonstrated the wisdom as well as the generosity of the donor. The first annual prize was awarded at the third Cincinnati meeting (January, 1924) and the second award was made at the fifth Washington meeting (January, 1925). The Cincinnati prize was awarded to Dr. L. E. Dickson, of the University of Chicago, for original work in mathematics. The second award, at Washington, was equally divided between two prizemen: Dr. Edwin P. Hubble, of the Solar Observatory of the Carnegie Institution, at Mount Wilson, California, for original work in astronomy; and Dr. L. R. Cleveland, of the School of Hygiene of the Johns Hopkins University, for original work in parasitology and general physiology.

The award will be made by the Committee on Prize Award, which is appointed under the authority of the association council. Suggestions are to be received from the secretaries of sections and of the societies that meet with the association on this occasion, and the winner will be selected from those suggested. Membership in the association will not be considered in making the decision. The winner of the prize will be announced in SCIENCE and in the daily press, shortly after the close of the meeting. According to the terms of the gift, the work of the younger men is recommended to special consideration by the committee. There will be no competition in the usual sense and manuscripts are not to be submitted unless asked for by the Committee on Award. The prize is to be given to the author of some noteworthy contribution to scientific advancement presented in the program of this meeting. Because of the fact that contributions in the several fields of knowledge are generally not readily commensurable, it is not intended that the prize paper is to be necessarily the very best of the meeting; it is to be *one of the best*. The prize will not be divided in the future, as it was at the fifth Washington meeting last year.

GENERAL SESSIONS AND POPULAR LECTURES AT KANSAS CITY

GENERAL SESSIONS

The plans for the Kansas City meeting include an exceptionally attractive series of lectures to be given before general sessions of the association. The general sessions are calculated to be of interest and importance to men and women of science, with the special aim of furnishing convenient means by which

[4] The number in parentheses denotes the calendar year at the end of which the member's term of office expires.

workers in any field of science may become familiar with problems, methods and results in other fields. They are presented under the auspices of the association or under the joint auspices of a science society and the association. These sessions are to be freely open to all who desire to attend. They are to be held in Kansas City Junior College, 11th and Locust Streets. The following announcements of general sessions may be made at this time.

On Monday evening, December 28th, at 8 o'clock, will be held the opening session of the Kansas City meeting. The president of the association, Dr. Michael I. Pupin, of Columbia University, will preside and the main lecture of the session will be the address of the retiring president of the association, Dr. J. McKeen Cattell, editor of SCIENCE, whose subject will be "Some psychological experiments."

The opening session will be followed by a general reception in the Kansas City Athletic Club, 11th and Baltimore Sts., to which all science workers and friends of the association are cordially invited.

On Tuesday evening will be given the Fourth Annual Sigma Xi Lecture, under the joint auspices of the association and the Society of Sigma Xi. President F. D. Farrell, of the Kansas State Agricultural College, will be the lecturer this year. His subject will be "A desert becomes a garden."

On Tuesday afternoon will be given the address of the president of the American Physical Society, Dr. Dayton C. Miller, of the Case School of Applied Science, on "The Michelson-Morley ether-drift experiment, its history and significance."

On Wednesday afternoon the Third Annual Josiah Willard Gibbs Lecture of the American Mathematical Society will be given under the joint auspices of the association and the society. The lecturer will be Professor James Pierpont, of Yale University, who will speak on "Some Modern Views of Space." Another program of general interest and of great present importance is planned for Wednesday afternoon, to be devoted to papers on the rôle of science in education. Arrangements for this program are in charge of the association's special committee on science in education, the chairman of which is Dr. Otis W. Caldwell, of the Lincoln School in New York City.

The Wednesday evening session is to be of special interest to engineering scientists. It will be devoted to discussions of the general relations of engineering to the fundamental sciences. President Pupin will preside.

At the Thursday evening session Dr. F. R. Moulton, of the University of Chicago, will speak on "The origin and evolution of worlds."

Other general sessions are being arranged and will be announced later.

POPULAR LECTURES

The American Association has adopted a plan by which the annual meeting is to include a series of illustrated popular lectures on scientific subjects, complimentary to the people of the city in which the meeting is held. Such a plan is followed by the British Association, with great benefit to the public and with marked success. These presentations are to be by prominent workers in science, who will speak with the authority of thorough knowledge, but they are to be as nontechnical as possible, capable of being understood by people who are not professional scientists.

The association is specially interested in thus helping to supply means by which people who are not engaged in science work and who have not received special education in science may become better acquainted with the great and far-reaching results of science and with the methods and aims of scientific investigators and teachers. Every individual in our communities, no matter what his status may be, constantly employs the practical results of scientific research, and the thoughts and feelings of all are being remoulded continually by philosophical and religious contributions from science specialists. Science is not just knowledge, it is even more an attitude of mind, a general method of thought. An appreciation of science furnishes by far the best general means yet brought forward for cultivating self-control in the individual—the best general means by which each of us may the better fit into his surroundings, attain more of his ideals and achieve greater satisfaction. The scientific method of approach to the problems and difficulties of life is now being so rapidly developed and enlarged that it amounts to something really new in human experience, especially on account of the fact that it is lately permeating the whole population.

The lectures given at the general sessions of this meeting will be interesting to people who are not scientists, and every one is invited to attend them. But the series of popular and illustrated talks is being specially prepared for those who are not educated and trained in science. They will furnish presentations of science made easy and interesting and will not involve unnecessary technicality. These lectures will be announced later.

It is hoped that this special effort of the association to bring a really valuable contribution to the intellectual life of the people of Kansas City may meet with interest, appreciation and approval.

THE SCIENCE EXHIBITION

The association is this year undertaking to produce a much more comprehensive and a much better arranged and handled exhibition than has ever been heretofore attempted at one of our annual meetings. Arrangements have been made to hold the exhibition in the Aladdin Hotel, which is just completed. The ball room and the two floors below it have been taken and ample space is provided for all exhibits.

The management of the exhibition is in the hands of Major H. S. Kimberly, of Washington, D. C., who has had much experience in this kind of work. Correspondence about the placing of exhibits and about securing advertising space in the general program of the meeting should be addressed to Major Kimberly, director of the Kansas City Exhibition, American Association for the Advancement of Science, Smithsonian Institution Building, Washington, D. C.

There is being secured for the exhibition an extensive and representative series of exhibits from individual scientific workers and from educational and research institutions. Members who have recently devised new research methods or improved demonstrations or who have secured research results that can be exhibited, are urged to place these on view at Kansas City. Every institution where scientific investigation is being carried on should be represented in what will, it is hoped, prove to be a sort of pageant of American scientific progress. Individuals, institutions and organizations are asked to contribute exhibits and to arrange for them immediately with the director of the exhibition. No charge will be made to individuals and research institutions. Only a little time remains, but this feature of the Kansas City meeting is to be made a landmark in the history of the association and the prompt and hearty cooperation of all scientific workers is needed.

Firms that manufacture or distribute scientific apparatus or materials or that publish scientific books are invited to take space in the Kansas City exhibition, arrangements for which are to be made with the director of the exhibition. Commercial exhibitors are asked to contribute toward the cost of the undertaking and to take advertising space in the general program of the meeting. The exhibition will offer a very unusual and perfect means by which manufacturers, publishers and dealers may bring their products directly to the attention of the professional men and women of science and the public generally. The benefits of such direct demonstration must be mutually helpful and must greatly stimulate American scientific advancement. Members of the association and members of the associated organizations are all asked to do all they can to help the director of the exhibition in securing the much needed cooperation of commercial firms.

The Kansas City exhibition will be located and arranged so as to be a convenient and pleasant meeting place for personal contacts and conversations among those who go to the great convention. All who attend are invited and urged to take advantage of this feature, to view the exhibits of both scientists and commercial firms and to help in this way toward making this new departure the great success that it surely ought to be.

PUBLICITY ARRANGEMENTS

The general public has rather recently become greatly interested in the progress of science and this interest continues to increase. One of its clearest manifestations is found in a correspondingly great and increasing demand from newspaper editors, who desire to furnish the public with accurate and trustworthy as well as interesting and understandable stories of recent scientific achievement. Especially, American newspapers have shown in recent years a marked and growing desire to report our annual meetings to their readers. The association heartily approves of this progressive tendency and it bespeaks a helpful attitude in this respect on the part of those who are to present papers or otherwise take part in the Kansas City meeting. It specially requests all who give papers at the meeting to make sure that their ideas and findings will be readily available for the press through our publicity organization.

A publicity office will be maintained, as usual, this year in charge of Mr. Lyle Stephenson, who is chairman of the local committee's subcommittee on publicity. The office will be in the Aladdin Hotel. It will have charge of the careful release of news items for the use of newspapers throughout the period of the meeting. Science Service, of Washington, in which the American Association has official representation, will again cooperate with the publicity office in this important work. This cooperation has proved highly efficient and helpful at recent annual meetings and the association welcomes its continuation for the Kansas City meeting.

Those who are to read papers or deliver addresses at the Kansas City meeting are asked to prepare, as soon as possible, two copies of each of their manuscripts, sending one copy to Mr. Lyle Stephenson, *in care of* Mr. W. M. Symon, *Convention Bureau, Chamber of Commerce, Kansas City, Mo., and the other copy to Science Service, 21st and B Sts., N. W., Washington, D. C.* Each manuscript should be accompanied by a summary or abstract as simply and as clearly phrased as possible, in a style to interest

the general reader. The summaries should not be over 400 words in length, *but the complete manuscript is wanted also in every case.*

The publicity office and Science Service will make use of these manuscripts and abstracts to supply local and distant newspapers with correct information for their publication. Material should be sent in just as soon as possible, but it will not be released to the press until the day each paper is read at the meeting. To be used to best advantage, manuscripts and abstracts should be in hand by December 15th. A large amount of work is involved in preparing releases for the newspapers, and fine promptness on the part of those who are to read papers at the meeting will greatly aid in the popularizing of science and in making the newspaper reports of the meeting (which appear throughout the country) accurate and truly representative of the work for which the association exists.

Manuscripts and summaries that are not sent in time to be received before the opening of the meeting should be handed in at the publicity office at the meeting. If copies of the manuscript can not be sent, be sure to send two copies of a summary, as above noted.

Those who are to take part in the Kansas City programs are asked and urged to do their share in this great work of publicity in which the association is engaged. Please do not neglect this request.

SESSIONS OF THE SECTIONS AND SOCIETIES AT KANSAS CITY

The various sections of the association and the many scientific societies that are to meet with the association this year will hold numerous sessions for the reading of papers and the delivering of addresses, by leaders and specialists in nearly all branches of science. A preliminary account of the section and society programs that are being arranged, so far as information about these had been received from the secretaries when this announcement went to press, is given in the following pages. Complete information about the various sessions will be given in the general program of the meeting. The following account is arranged under headings that correspond to the sections of the association.

A. Mathematics.—The American Mathematical Society and the Mathematical Association of America will meet jointly with Section A of the A. A. A. S. on Wednesday forenoon, December 30. Professor J. C. Fields, of the University of Toronto, retiring vice-president for Section A, will deliver an address on "The algebraic numbers and division" and Professor T. H. Hildebrandt, of the University of Michigan, retiring vice-president of the American Mathematical Society, will also address this session, his subject being "The Heine-Borel theorem and allied theorems." The third annual Josiah Willard Gibbs Lecture will be given, under the joint auspices of the American Mathematical Society and the American Association, by Professor James Pierpont, of Yale University, at a general session of the association on Wednesday afternoon. Professor Pierpont's address will be on "Some modern views of space." The American Mathematical Society will hold its sessions for the reading and discussion of papers on Tuesday, December 29, and the Mathematical Association of America will hold similar sessions on Thursday, December 31. Professor J. L. Coolidge, of Harvard University, will deliver his retiring vice-presidential address on "Robert Adrain and the beginnings of American mathematics." An informal dinner for all mathematicians and their guests will be held at the City Club of Kansas City on Wednesday evening, December 30. The headquarters for the mathematicians will be at the Baltimore Hotel, 12th and Baltimore Streets.

B. Physics.—Section B will hold a joint session with the American Physical Society on Tuesday afternoon, December 29, at which Professor K. T. Compton, of Princeton University, retiring vice-president for Section B, will deliver an address on "Dielectric constants and molecular structure." This address will be followed by a symposium, details of which will be announced later. The American Physical Society will hold sessions for the reading and discussion of papers on Monday, Tuesday and Wednesday, December 28 to 30. Professor D. C. Miller, of the Case School of Applied Science, will deliver his vice-presidential address on "The Michelson-Morley ether-drift experiment—its history and significance." There will be a dinner for members of the society on Tuesday evening, December 29. The American Meteorological Society will meet for the first time in the Kansas City region when it meets with the association this year. The society will hold its sessions on Monday and Tuesday, December 28 and 29, and the problems of weather and climate peculiar to the great interior plains of North America will be discussed. Mr. S. D. Flora will speak on "Tornadoes of the Middle West" and Dr. Dinsmore Alter will discuss "Rainfall periods." Among other topics, the effects of weather on crops and long-range weather forecasting will probably be subjects for discussion. An excursion to the University of Kansas is being planned.

C. Chemistry.—Section C will hold joint sessions with the Kansas City and neighboring sections of the American Chemical Society on the forenoons and afternoons of Tuesday, Wednesday and Thursday,

December 29 to 31. It is planned to devote one day to the chemistry of milling and baking and other characteristic industries of the Kansas City region. Special half-day sessions will be devoted to several of the fundamental branches of chemistry and it is hoped, in this connection, that joint sessions may be arranged with other sections of the association. Dr. F. G. Cottrell, director of the Fixed Nitrogen Research Laboratory, will deliver his retiring vice-presidential address on "The relation of pure science to technology in government research." Further details will be given in the general program of the meeting.

D. Astronomy.—Section D is arranging a program which will be of interest to visiting astronomers and to members of the local astronomical society. It is planned to have the meetings of the section begin on Wednesday, December 30, thus allowing the members to visit other sections on Monday and Tuesday. Joint sessions with Sections A and B are being arranged.

E. Geology and Geography.—Section E will hold sessions for the reading and discussion of papers on Monday, Tuesday and Wednesday, December 28 to 30. At one of these sessions W. C. Mendenhall, of the U. S. Geological Survey, retiring vice-president for Section E, will deliver an address on "Some modern trends in American geology." Plans are under way for an exhibition of interest to geologists and geographers.

F. Zoological Sciences.—Section F is planning a complete program which will extend over several sessions. The papers presented by members of the section will be arranged under such groups as embryology, cytology, comparative anatomy, physiology, genetics and ecology. Other groups will be added if necessary. Dr. Edwin Linton, of the University of Georgia, will deliver his retiring vice-presidential address on "The scientific method and authority," on Tuesday afternoon, December 29. Professor C. E. McClung, of the University of Pennsylvania, will also deliver an address at this session on "A quarter-century of American cytology." A joint session with the Ecological Society of America is planned for Thursday afternoon, December 31. The Entomological Society of America will hold morning and afternoon sessions on Tuesday and Wednesday, December 29 and 30. The closing session will be on Wednesday evening, when Dr. Vernon Kellogg, permanent secretary of the National Research Council, will deliver the annual public address of the society on "Isolation or cooperation in science." A symposium on "Insect parasitism" will be held at a joint session with the American Association of Economic Entomologists on Wednesday afternoon, December 30. The sessions on Monday afternoon and Tuesday are reserved for contributions by members and plenty of time for discussion is assured. The business session will be held on Wednesday morning at ten o'clock. There will, as usual, be an exhibit of specimens, apparatus, photographs, drawings and uniques. The Hotel Baltimore will be headquarters for all entomologists. The American Association for Economic Entomologists will hold its thirty-eighth annual meeting from December 29 to January 2. The Section of Quarantine and Inspection will meet Tuesday, December 29, their program to continue throughout the day. The Extension Entomologists plan to hold a meeting Tuesday evening. The Section of Apiculture is to meet Wednesday morning. Wednesday afternoon will be devoted to a symposium on parasitism in a joint session of this association with the Entomological Society of America. Thursday morning will mark the opening session of the Economic Entomologists, at which time the presidential address will be delivered by Professor H. A. Gossard, entomologist, Agricultural Experiment Station, Wooster, Ohio. Business will also be transacted at this session. The remaining sessions on Thursday, Friday and Saturday will be devoted to reading of papers and discussions by the membership, terminating with a final business session on Saturday. The entomologists will hold a dinner Friday night. There will be exhibits, as usual, of life history mounts of injurious insects, photographs of damage wrought by them and apparatus. The American Society of Parasitologists, a newly organized society, will hold sessions on Tuesday, Wednesday and Thursday, December 29 to 31. An important feature of the program will be the retiring address of the first president of the society, Professor Henry B. Ward, on "The needs and opportunities of parasitology." A joint symposium with Section N (Medical Sciences) on the "Diseases produced by animal parasites in the United States" will be held on Wednesday afternoon, December 30. Among the speakers at the symposium will be Professor W. A. Riley, who will represent the Medical Entomologists, and Dr. M. C. Hall, who will discuss the subject of anthelmintics. At the business meeting of the society a permanent constitution will be adopted. It is planned to hold a luncheon for members and guests of the society on Wednesday noon before the symposium. At least two half-day sessions for the presentation of papers are planned.

G. Botanical Sciences.—Section G will meet jointly with the several botanical societies on Tuesday afternoon, December 29. At this session the following invitation papers will be presented: "Botanical problems of tropical agriculture," by Dr. W. A.

Orton, director of the Tropical Plant Research Foundation; "The present crisis in plant physiological science," by Dr. Burton E. Livingston, of the Johns Hopkins University; "The nature and cause of persistency of secondary sexual states with special reference to Typha," by Dr. John H. Schaffner, of Ohio State University; "Stimulative and formative substances in plants," by Dr. F. E. Denny, of the Boyce Thompson Institute for Plant Research. From Dr. George T. Moore, director of the Missouri Botanical Garden, has been received a communication by which the Missouri Botanical Garden cordially invites those who may be able to do so to stop at St. Louis *en route* to Kansas City and to visit the Garden on Sunday, December 27. The laboratories, library and herbarium will be open all day and opportunity will be offered for viewing many of the plant collections. The Garden also invites those who accept this invitation to be its guests at a dinner on Sunday evening at 7:30. Arrangements will be made by which guests at the dinner will be enabled to arrive in Kansas City Monday morning. Those planning to take advantage of this exceptional opportunity to visit the Missouri Botanical Garden should purchase their tickets to Kansas City through St. Louis and have them read *via* the Missouri Pacific Railroad from St. Louis to Kansas City. Those who plan to attend the dinner Sunday night are to intimate this to Dr. Moore immediately, also informing him if they wish to have a berth reserved on the Sunday night train from St. Louis to Kansas City on the Missouri Pacific, and whether an upper berth would be acceptable.

The Botanical Society of America will hold sessions on Tuesday, Wednesday and Thursday, December 29 to 31. All sections will hold programs, including papers of a general nature and discussions of particular topics. The Joint Genetics Section and the General Section will meet as usual for the reading of papers and the Physiological Section will conduct a joint session with the Ecological Society of America on Wednesday forenoon and another with the American Society of Plant Physiologists on Thursday forenoon. The Mycological Section will devote one session to "Sexuality in fungi" and the Systematic Section will receive further reports on the topic discussed at the Washington meeting, the training of systematic workers. The joint session with Section G of the American Association will be held on Tuesday afternoon. The dinner for all botanists is planned for Tuesday evening. Exhibits and demonstrations will add to the interest of the meeting.

The American Phytopathological Society will hold sessions on Tuesday, Wednesday and Thursday, December 29 to 31. Sessions of special interest this year are the Extension Pathologists' conference on Tuesday afternoon; a conference, to be held on Wednesday forenoon, on the teaching of plant pathology in our universities and agricultural colleges; a joint session on Wednesday afternoon with the Potato Association of America on the subject of potato diseases, and a symposium on Thursday afternoon with the American Society of Agronomy on "Selection and breeding of cereal and feed crops for disease resistance." On Tuesday afternoon the society will hold a joint session with Section G of the association. The Phytopathologists' dinner with its entertainment features will take place on Wednesday evening, December 30.

F-G. Societies related to both Sections F and G (Zoological and Botanical Sciences).—The Ecological Society of America, with membership open to all who are interested in any phase of the interrelationship of organisms and their environments, will hold its annual meeting from December 29 to 31. On Wednesday morning a joint session will be held with the Botanical Society of America and Wednesday afternoon will be devoted to a symposium on the "Plant and animal ecology of the prairie." The program of the last-mentioned session is in charge of Dr. A. S. Pearse, of the University of Wisconsin, president of the society. On Thursday afternoon there will be a joint session with Section F of the American Association. The remaining sessions will be devoted to the reading of papers of general ecological interest. There will be an informal dinner, to which all biologists interested in ecology are invited. The headquarters of the society will be at the Baltimore Hotel. Persons not members of the society may obtain copies of the advance program, with abstracts of papers to be given, by writing to the secretary after December 1.

The Executive Committee of the American Microscopical Society will have a luncheon at 12 on Wednesday, December 30, and the regular annual business meeting will occur at 4:30 on the same day.

The Phi Sigma Biological Research Society will hold its annual convention on the forenoon of Monday, December 28, and this will be followed by a luncheon for members of the society. The afternoon session on Monday will be devoted to a scientific program by active members of various chapters. Further details will be given in the general program of the meeting.

The American Nature-Study Society will hold sessions on Monday and Tuesday, December 28 and 29. It will meet jointly with the American Nature Association and the program will be representative of the activities of the two organizations. In addition to

papers dealing with the problems of science-teaching in elementary schools, in various social units, there will be outlined a survey of the situation being conducted by the American Nature Association. The address of the president, Mr. M. R. Van Cleve, director of nature study and general science, Toledo, Ohio, on "The chief function of nature study" will be given at the Tuesday afternoon session.

H. Anthropology.—The meetings of Section H will take place on Wednesday, Thursday and Friday, December 30 to January 1, with morning, afternoon and probably evening sessions, and on Saturday, January 2, with a morning session. At one of these sessions Professor E. A. Hooton, of Harvard University, will read his retiring vice-presidential address on "Methods of racial analysis." In conjunction with this meeting of Section H there will be held a meeting of the Committee on State Archeological Surveys on Wednesday, December 30. A meeting of the section is tentatively set for Friday, January 1, at 12 noon. The exact hours and places for meeting will appear in the final program. Return postal card notices of the meeting of Section H have been mailed to members requesting replies as to attendance at the meeting, presentation of papers, specimens and apparatus for exhibition and attendance at a subscription dinner for the Anthropologists; communications on these subjects should be sent at the earliest possible moment (not later than December 5) to the secretary of Section H, Dr. R. J. Terry, Washington University School of Medicine, St. Louis, Mo.

I. Psychology.—Section I will hold sessions for the reading and discussion of papers on Wednesday, Thursday and Friday, December 30 to January 1. On Wednesday evening there will be a joint dinner with Section Q (Education) and with the Phi Delta Kappa Educational Fraternity. At this dinner the address of the retiring vice-president for Section Q, and probably also that of the retiring vice-president for Section I, will be given. On Thursday two joint sessions with Section Q will be held, with invited papers on the "Technique of testing" and on "Laboratories for the study of pre-school children, or studies in the mental development of children." Professor C. E. Seashore, of the University of Iowa, will give an illustrated lecture on "Scientific methods of vocational guidance in music." At the morning and afternoon sessions on Friday there will be short papers, contributed by members of the section, on the results of research in psychology.

K. Social and Economic Sciences.—Section K will hold sessions on the forenoon and afternoon of each of the days, Tuesday, Wednesday and Thursday, December 29 to 31. It will have this year a symposium on "Research methods and results." The papers to be presented will emphasize particular phases of research, including a large variety of subjects, introduced by an address on "Research and progress" by the retiring vice-president, Dr. Thomas S. Baker, of the Carnegie Institute, Pittsburgh. This will be followed by an address on "Research in forestry taxation" by the vice-president for Section K, Professor Fred R. Fairchild, of Yale University, followed by Mr. Maurice A. Holland, of the National Research Council, and Mr. E. P. Stevenson, of Arthur D. Little, Inc., Cambridge, Mass. At the second session there will be papers on "Science, charlatanry and nutrition," by Dr. H. E. Barnard, of the American Institute of Baking; on "Scientific nutrition and modern foods," by Dr. C. Robert Moulton, of the American Meat Packers Institute; and "The future of agricultural research," by Mr. E. D. Ball, entomologist of the Florida State Plant Board. The third session will be opened by an address on "Cooperation between industry and university," by Dr. George D. McLaughlin, of the Tanners' Council Laboratory, followed by an address on "Science in the lime industry," by Mr. G. J. Fink, and one on "Research in synthetic plasters," by Mr. L. V. Redman, of the Bakelite Corporation. The fourth session will commence with an address on "Scientific research, as applied to concrete construction," by Mr. Duff A. Abrams, of the Lewis Institute, followed by an address on "The administration of research under the industrial fellowship system," by a representative of the Mellon Institute. The last address of this session will be on "Air transportation," by Lieut. J. Parker Van Zandt. The fifth session will open with an address on "Research and the incandescent lamp industry," by Dr. Forsythe, of the National Lamp Works, followed by an address on the "Economic basis of medical charges," by Dr. Michael M. Davis, and one on "Cancer research," by Dr. F. L. Hoffman. The last session, on the third day, will be introduced by a paper on "A résumé of research work of underwriters' laboratories," by Mr. A. H. Nuckolls, followed by an address on "Research in insurance," by a representative of the Woods Agency, Pittsburgh. There will also be an address on "The application of research to the rubber industry," by Mr. R. P. Dinsmore, of the Goodyear Rubber Company, the last address to be given by Mr. F. O. Clements, of the General Motors Corporation, Detroit.

The Metric Association will hold its annual meeting on Monday, December 28. Manufacturers, merchants, educators and others are urged to attend and take part in the sessions. Following the address of welcome, manufacturers in various fields and from many parts of the country will discuss the problems of changing over to the exclusive use of metric weights

and measures. A conference of educators will follow, at which time representative men and women interested in education will discuss the various phases of the metric movement and methods of teaching. Dr. George F. Kunz, president of the Metric Association, will preside. A luncheon will be held at the Kansas City Athletic Club at 1:00 P. M. The general conference will be held during the afternoon, following a short executive session, election of officers, etc. Papers will be presented by leaders of the metric movement in the United States and discussion will be open to all. Arrangements are being made with local educational authorities to have an intercollegiate debate staged at 5:00 P. M., on the question, "Resolved, that the metric system should be adopted for general use in the United States." The meeting will close with a "Metric Dinner" to be held at the Hotel Muehlebach at 7:00 P. M. Monday evening. Reservations for the dinner should be made early. Men and women interested in metrology and standardization are invited to take part in the program. Federal, state and municipal departments and all organizations interested are requested to send representatives. Programs may be secured from the Metric Association, 156 Fifth Avenue, New York, N. Y.

L. Historical and Philological Sciences.—The program of the Historical Sciences portion of Section L will this year be held in joint session with Sections A (Mathematics), C (Chemistry) and D (Astronomy) and it is designed to conform to arrangements and dates fixed by these sections. It is planned that Section L will present at each meeting the life and work of some noted American scholar, and Professor William H. Roever, of Washington University, St. Louis, will this year give a paper containing the results of his study on the "Life and work of William Chauvenet," with special reference to Chauvenet's mathematical contributions to astronomy. Another paper will be by Professor Florian Cajori, of the University of California, on "The early studies of Sir Isaac Newton," especially Newton's early study of the Apocalypse. The story of the first text-book of arithmetic in America will be given by Professor L. C. Karpinski, of the University of Michigan. Dr. Frank B. Dains, of the University of Kansas, will present an illustrated paper on "Some phases in the early development of chemical symbols."

M. Engineering.—Three sessions are being planned for Section M, to be held on the forenoon, afternoon and evening of the same day. The evening session will be devoted to a discussion by speakers of national reputation, especially emphasizing the relation of engineering to the fundamental sciences. At the morning session papers will be presented dealing with engineering accomplishments which have advanced science and with the contribution of science to engineering. At this session the address of the retiring vice-president for Section M, Professor A. E. Kennelly, of Harvard University, on "Advancement of engineering in relation to the advancement of science," will be read. The afternoon session will be along similar lines, but with more time for discussion. More detailed information, including the date and place of the session, will be given in the general program of the meeting. Since the last meeting a conference has been held between representatives of the engineering societies, the president of the American Association, and officers of the section, in regard to closer relations between engineers and other scientific men and the placing of greater emphasis on the relation between engineering and the advancement of science. There will be ample opportunity to discuss these important subjects.

N. Medical Sciences (see also F, above).—Section N is planning to hold two sessions on Wednesday, December 30. The morning session will be devoted to a symposium on "Borderline and interrelated problems in the fields of pathology, bacteriology, anthropology, physiology, public health and medicine." Professor William G. MacCallum, of Johns Hopkins University, will open the session with the retiring vice-presidential address on "A survey of our present knowledge of filterable viruses." Professor C. H. Danforth, of Leland Stanford University, will discuss borderline problems of anatomy, anthropology and medicine. Professor Ralph G. Mills, of the University of Colorado, will discuss borderline problems of bacteriology, serology, chemistry and public health. Professor A. J. Carlson, of Chicago, will preside. Other speakers, to be announced later, will discuss other border and interrelated problems and the session promises to be a stimulating and rounded seminar of interest to all workers in these fields. In conformity with the policy of this section to bring together workers in related fields, there is planned a joint session with the American Society of Parasitologists on the afternoon of December 30. This session will be devoted to a discussion of "Diseases produced by animal parasites in the United States." Professor H. B. Ward, of the University of Illinois, will read the address of the first retiring president of the society, his subject being "The needs and opportunities in parasitology." Professor William A. Riley, of the University of Minnesota, will discuss parasitology from the point of view of the medical entomologist. Other speakers will discuss this most important problem from the point of view of public health, pathology, etc.

O. Agricultural Sciences (see also G, above).—Section O has arranged for a joint program to be

given with the American Phytopathological Society and the American Society of Agronomy on Thursday afternoon, December 31. This session will be devoted to a symposium on the subject, "Breeding for disease resistance," and the retiring vice-president for Section O, Dr. L. R. Jones, of the University of Wisconsin, will deliver his address on "Securing disease-resistant plants, how important is it, whose job is it?" at this symposium. The section has arranged no separate program but will meet in conjunction with the several affiliated societies.

The American Society of Agronomy will hold a joint symposium with the American Phytopathological Society and Section O on Thursday afternoon, December 31, the subject of the symposium being "Breeding for disease resistance."

The Association of Official Seed Analysts of North America will hold its annual meeting on Tuesday, Wednesday and Thursday, December 29 to 31. A very interesting program is being arranged. An outstanding feature will be a round table discussion on various phases of seed germination. This session will be of vital interest to every seed analyst as well as botanists and taxonomists. Results of investigational work done by the members during the year will be reported. Dr. David Schmidt, who has started his third year's work on the "hard seeds" in legume seeds, will report the results of his investigations to date. The annual certification of seed laboratories, on the basis of performance, will attract much interest. The first woman president of the association, Miss Anna M. Lute, of Colorado, will deliver the president's address at the annual banquet on the evening of December 30.

The Potato Association of America will hold its twelfth annual meeting at Kansas City on Tuesday, Wednesday and Thursday, December 29 to 31, and this meeting promises to be one of the best ever held by the association. The morning session on Tuesday, December 29, will be devoted to introductory remarks by the president, reports of the secretary-treasurer, of the editor and business manager of *The Potato News Bulletin* and of the chairmen of the various permanent committees. Tuesday afternoon's session will be devoted to the discussion of seed certification, with reference to: (1) "The value of regional disease demonstration plots in the training of inspectors," (2) "Administration of seed-potato certification," (3) "The value of the certified seed plot in certification," (4) "Methods of conducting and the importance of the seed plot in potato improvement work," (5) "Problems confronting the certification authorities." The Wednesday morning session will be devoted to a consideration of seed-potato disinfectant methods, on which seven papers are to be read. A joint session will be held in the afternoon with the American Phytopathological Society. At this session papers dealing with potato diseases will be read and discussed by members of both organizations. The morning and afternoon sessions on Thursday, December 31, will be devoted to the presentation of miscellaneous papers, reports of committees, election of officers, *et cetera.*

The American Society for Horticultural Science will meet on Tuesday, Wednesday and Thursday, December 29 to 31, holding two sessions each day. For December 30 there will be simultaneous sessions on vegetables and fruits. President H. C. Thompson, of Cornell University, will give an address on "Some important research problems in vegetable production and handling." Other subjects on vegetable growing are: Effects of fertilizers on sweet potatoes; factors influencing the curing of sweet corn; varieties of corn and methods of making hominy; training and pruning tomatoes; ripening tomatoes with ethylene gas; effect of nutrition on number and dropping of tomato blossoms; importance of phosphorus in forming seed and pulp of tomatoes; steam sterilization of greenhouse soil; toxic relation of other crops to tomatoes; fruiting habit and pollination of the watermelon; carbohydrate nitrogen relations in seeding celery; types and varieties of celery; physical and chemical changes in celery during storage; factors influencing seed production of wintered over cabbage; value of check plots in cabbage and tomato fertilizer experiments; horticultural types of cucurbits. Some of the fruit topics are: Handling Italian prunes for fresh fruit shipment; propagation of own-rooted apple stocks; polarity in the formation of scion roots; propagating apple trees on their own roots; use of burr-knots in propagating apples by cuttings; importance of the organic content of the soil in orchard fertilizer experiments; effect of girdling filler trees and its commercial possibilities; effect of time of plowing under cover crops on soil moisture and nitrates; color pigment in relation to the development of Jonathan spot; effect of imbreeding on the vigor of apple seedlings; pollination studies of McIntosh, Cortland and Baldwin apples; sterility in the Winesap group of apples; relation of temperature to pollen tube growth *in vitro;* fruiting habit of the grape; effects of fruiting on Concord grape vines; effects of pruning on grape production; growth and yield of Concord grape vines; growth and fruitfulness in some varieties of apples; is fruiting of the apple an exhaustive process?; fruiting habit of York Imperial apple; fruit-bud formation and growth; regularity of bearing in the Baldwin apple as influenced by fertilizers; fruit spur composition in relation to fruit-bud formation; relation of leaf area to the growth of apples; meaning of chemical analyses of horticultural plants; effect of

nitrate of soda and sulphate of ammonia on the chemical composition of spurs at critical times; relation of chemical composition of fruit spurs to fruit bud formation; results of bending the branches of young apple and pear trees; factors influencing the production of peaches in the south; influence of varieties of peaches upon their progeny; flower bud formation in the Dunlap strawberry; field plot technic with strawberries; sprays and spraying material; uncongeniality in disease resistant stocks; use of plant characters to identify red raspberry varieties; use of leaf characters in identifying plums; storage and Balling-concentration of cherries; soft scald and breakdown of apples in storage; maturity of California fruits for eastern shipments. There will be no joint meetings with other societies.

Q. Education (see also I, above).—Section Q is arranging an interesting program, details of which will be given in the general program of the meeting. The retiring vice-presidential address by Professor L. A. Pechstein, of the University of Cincinnati, will be given at a joint session of the section with Section I (Psychology) and the Phi Delta Kappa Fraternity on Wednesday evening, December 30. Two joint sessions will be held with Section I on Thursday, December 31. A general session on Wednesday afternoon is being planned, to be devoted to the rôle of science in education. The program is being arranged by Dr. Otis W. Caldwell, of the Lincoln School, New York City, who is chairman of the American Association's special committee on this subject. On Wednesday evening will be held the annual dinner of the Phi Delta Kappa Fraternity, to which all students of education are invited. It will be followed by a joint session of the fraternity and Sections Q and I.

Societies Not Specially Related to Any Particular Section.—The Society of Sigma Xi will hold jointly with the association the general session of Tuesday evening, December 29, on which occasion the fourth annual Sigma Xi lecture will be given by President F. D. Farrell, of Kansas State Agricultural College, on "A desert becomes a garden." A business session of the society will be held at 2 on Tuesday, to be followed by the annual Sigma Xi banquet at 6:15. The Gamma Alpha Graduate Scientific Fraternity will hold its annual meetings and banquet on Tuesday, December 29. The early date (Tuesday) for the banquet will necessitate prompt registration at the Gamma Alpha booth in the association registration room. The Honor Society of Phi Kappa Phi will hold its ninth biennial convention on Thursday, December 31; sessions will begin at 10 and 2 o'clock, with the convention dinner the same evening. In addition to important business to be considered at the convention, one or two papers will be given on ways and means of promoting interest in better scholarship among college students. The headquarters of the society will be the Baltimore Hotel.

LOCAL ARRANGEMENTS AND TRANSPORTATION

RAILROAD TICKETS

Reduced Rates and Dates

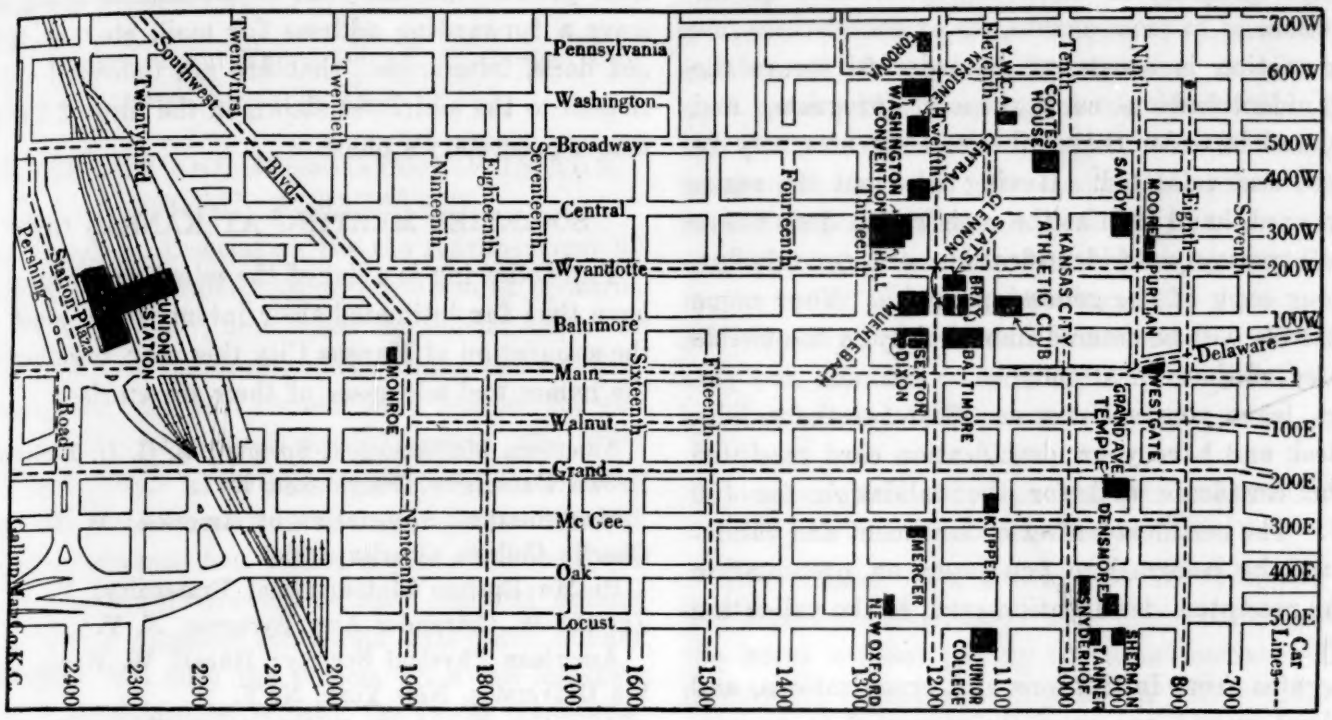
Reduced railway rates, certificate plan, for those attending this meeting have been granted by railway passenger associations of the United States and Canada. The association is again very fortunate this year, and the courtesy and public spirit of the railway associations will be greatly appreciated. The round-trip fare is to be one-and-a-half times the regular one-way fare.

Tickets to Kansas City are to be purchased within time limits as follows. December 24 to 30, inclusive, for the following lines: Canadian Eastern lines, New England lines, Trunk lines, Central lines, Southeastern lines, Western and Transcontinental lines from Colorado, Illinois, Iowa, Kansas, Manitoba (on Great Northern, Northern Pacific, and Minnesota, St. Paul & Sault Ste. Marie Ry., also from Winnipeg *via* Canadian Pacific Ry.), Minnesota, Missouri, Nebraska, Northern Michigan, North Dakota, South Dakota, New Mexico, Wisconsin, and Wyoming. December 23 to 29, inclusive, from Arizona, Montana, and Utah. December 22 to 28, inclusive, from British Columbia, California, Idaho, Nevada, Oregon, and Washington. For the Southwestern lines the limits are December 24 to 30. (The following Southwestern lines *are not party* to the reduced excursion fares: Arkansas & Louisiana-Missouri Ry.; Ft. Smith & Western R. R.; Graysonia, Nashville & Ashdown R. R.; Jonesboro, Lake City & Eastern R. R.; Kansas, Oklahoma & Gulf Ry.; Louisiana & Arkansas Ry.; Mississippi River & Bonne Terre Ry.; National Railways of Mexico; St. Louis, El Reno & Western Ry.)

Purchasing Tickets to Kansas City

1. *For persons residing in the regions of reduced rates (almost all the U. S. and Canada, see above.)*—Purchase a first-class, full-fare, one-way, through ticket to Kansas City, and be sure to secure a certificate on Standard Certificate Form reading for the Kansas City meeting of the "American Association for the Advancement of Science and Associated Societies"; a receipt is not required.

2. *For persons residing outside of the regions of reduced rates.*—Purchase a round-trip ticket to nearest station issuing through tickets to Kansas City and lying within the region of reduced rates. At that station purchase a one-way ticket to Kansas City



and secure a certificate as directed in the preceding paragraph.

Endorsement of Certificates by A. A. A. S. and Validation by Transportation Companies

Upon arrival at the meeting, register immediately in the registration room in the Aladdin Hotel. On the registration card be sure to fill in the blanks referring to railway tickets. Secure a numbered identification card at the registration desk. After registering and receiving your identification card, leave your railway certificate at the validation desk, being sure that your identification card is there marked to show that you have deposited a certificate and paid the validation fee of 50 cents. Retain the identification card. Your certificate will later be endorsed by the agent of the American Association and validated by the agent of the transportation companies. Call for it later at the validation desk, presenting your identification card. Unvalidated certificates will not be honored for the purchase of return tickets, and unendorsed certificates can not be validated. The funds secured by the association in the form of validation fees are to be used to defray a portion of the expense of operating the registration offices, etc. The fee (50 cents) is to be payable when the railway certificate is deposited at the validation desk.

Purchasing Return Tickets from Kansas City

The ticket agents at Kansas City will honor any properly endorsed and validated certificate if presented at least 30 minutes before the train for which it is to be used is due to leave. To each person presenting an endorsed and validated certificate they will sell a continuous-passage, one-way, return ticket for one half of the regular fare, by the same doute as that followed in the trip to Kansas City. The last date on which certificates may be validated is December 31. The last date on which return tickets may be purchased is January 6.

LODGING AND LUNCHEON ACCOMMODATIONS

The meeting places for the Kansas City convention will be near together and in or near the hotel district of the city. A list of Kansas City hotels has been published in SCIENCE for November 14th. The Aladdin Hotel will be the general headquarters of the association and it can supply many rooms. Some of the organizations that will meet with the association have named other hotels as their headquarters. Available information in this regard is given in this announcement under the heading, Sessions of the Sections and Societies. *Hotel rooms should be engaged at once if not already cared for.* A map of the central part of Kansas City, furnished by the Kansas City Convention Bureau, is shown on this page. Convenient accommodations for luncheons and other meals will be available.

REGISTRATION AT KANSAS CITY

Those who attend any of the Kansas City sessions, which will be fully open to all, whether they are members of the association or not and whether they are from away or reside in Kansas City, should register as promptly as possible. The registration room will be in the Aladdin Hotel. The registration offices will be open from 9 A. M. to 9 P. M. on the first three days, and from 9 to 5 on the remaining days. Registration will be in charge of Mr. Sam Woodley,

executive assistant, of the Washington office of the association.

Registration is necessary, in order to secure the official identification card, general program, and badge, and in order that railway certificates may be endorsed and validated. Having filled out the registration card, hand it in at the registration desk where you will receive your identification card, your badge, and your copy of the general program. Your name and address will be entered immediately in the visible directory of those in attendance.

Next, leave your railway certificate at the validation desk and have your identification card receipted for the certificate and for the validation fee (50 cents). The certificate, after endorsement and validation, will be returned to you later, on presentation of your receipted identification card, at the validation desk.

Delegates from institutions and organizations, and all official guests, are specially requested to register as such.

INFORMATION SERVICE AT THE KANSAS CITY MEETING

Those in attendance at the meeting may obtain information of all sorts by applying at the information desk in the registration room at the Aladdin Hotel. Attention is called, however, to the visible directory of those in attendance, from which information regarding attendance, and the addresses of attending members of the association and societies, may be obtained without application at the desk. Also, a bulletin board will be installed in the registration room, which will furnish information of various kinds.

Before the meeting, information may be obtained from the secretaries of the sections or of the associated societies or other societies meeting with the association at Kansas City (regarding programs, etc.), from the members of the local committee on special arrangements or the local representatives of sections (regarding local arrangements), or from the permanent secretary's office in the Smithsonian Institution Building, Washington (regarding general association affairs).

MAIL, EXPRESS, TELEGRAMS, ETC.

Persons attending the meeting may have mail, etc., addressed to them in care of the American Association for the Advancement of Science, Registration Room, Aladdin Hotel, Kansas City, Mo. They should call at the registration room daily, to inspect the personal bulletin, which will be conveniently located. If a person's name appears on this bulletin, he should inquire at the proper desk for mail, etc.

At the close of the meeting, or upon departing, each person who has been in attendance is urged to leave a forwarding address for mail, etc. If this is not done, letters, etc., that are not delivered will be re-sent to the addresses shown in the files of the permanent secretary's office.

SOCIETIES MEETING AT KANSAS CITY

THE following is a list of the scientific societies that have thus far intimated their intentions to meet with the association at Kansas City this year, together with the names and addresses of their secretaries:

American Mathematical Society; R. G. D. Richardson, Brown University, Providence, R. I.

Mathematical Association of America; W. D. Cairns, Oberlin College, Oberlin, Ohio.

Pi Mu Epsilon Mathematical Fraternity; E. D. Roe, Jr., 123 W. Ostrander Ave., Syracuse, N. Y.

American Physical Society; Harold W. Webb, Columbia University, New York, N. Y.

American Meteorological Society; Charles F. Brooks, Clark University, Worcester, Mass.

Entomological Society of America; C. L. Metcalf, University of Illinois, Urbana, Ill.

American Association of Economic Entomologists; C. W. Collins, Melrose Highlands, Mass.

American Society of Parasitologists; W. W. Cort, 310 W. Monument St., Baltimore, Md.

Wilson Ornithological Club; Gordon Wilson, 1434 Chestnut St., Bowling Green, Ky.

Botanical Society of America; I. F. Lewis, University, Va.

American Phytopathological Society; R. J. Haskell, Bureau of Plant Industry, Washington, D. C.

American Society of Plant Physiologists; Wright A. Gardner, Alabama Polytechnic Institute, Auburn, Ala.

Ecological Society of America; A. O. Weese, University of Oklahoma, Norman, Okla.

American Microscopical Society; H. J. Van Cleave, University of Illinois, Urbana, Ill.

American Nature Study Society; E. Laurence Palmer, Renwick Heights, Ithaca, N. Y.

Phi Sigma Biological Research Society; C. I. Reed, Baylor University Medical School, Waco, Tex.

Metric Association; Howard Richards, Jr., 156 Fifth Ave., New York, N. Y.

American Society of Agronomy; P. E. Brown, Iowa State College, Ames, Iowa.

American Society for Horticultural Science; C. P. Close, College Park, Md.

Association of Official Seed Analysts; A. L. Stone, University of Wisconsin, Madison, Wis.

Potato Association of America; William Stuart, U. S. Department of Agriculture, Washington, D. C.

Phi Delta Kappa Fraternity; Clayton R. Wise, 10403 St. Clair Ave., Cleveland, Ohio.

Society of Sigma Xi; Edward Ellery, Union College, Schenectady, N. Y.

Gamma Alpha Graduate Scientific Fraternity; J. E.

Ackert, Kansas State Agricultural College, Manhattan, Kans.

Honor Society of Phi Kappa Phi; C. H. Gordon, University of Tennessee, Knoxville, Tenn.

MEMBERSHIP AND ASSOCIATESHIP IN THE AMERICAN ASSOCIATION

The American Association for the Advancement of Science is now a cooperative organization of upwards of 14,000 individuals, and it has the official approval of more than a hundred science organizations that are associated with it. Its aim is to further the advancement of science in all feasible ways. The work of the association is mainly supported by contributions made by its members and associates. Annual members contribute five dollars a year, life members make a single contribution of one hundred dollars and sustaining members contribute a thousand dollars at one time, but only the income from the last two classes of contributions is used, the funds themselves being permanently invested. Associates contribute five dollars toward the expenses of the meeting for which they become associates. Members receive either the official journal, SCIENCE, or *The Scientific Monthly*. The fiscal year begins October 1 and the corresponding journal subscriptions begin the following January 1. New annual members pay an entrance fee of five dollars when they join the association, but this may be omitted by life and sustaining members. It may also be omitted by members of newly affiliated societies and by new members of all affiliated societies.

The easiest and one of the most effective ways by which an individual may aid the advance of knowledge and prepare the way for finer and fuller lives among those of coming generations is to maintain membership in the American Association. The association needs the help of every one who appreciates these aims. Its work is limited in extent and in influence only by its limited funds and the extension and improvement of its various activities is following closely upon its recent rapid gain in membership and the consequent possibility of increased expenditure. Those who are not already members and who are willing to take part in the work of the association are asked to join. They should fill in the blanks on a membership application card and send it, with proper remittance, to the Washington office of the permanent secretary, or else present card and remittance at the registration desk at Kansas City. Copies of a pamphlet on the organization and work of the association, as well as membership application cards and sample copies of the journals, may be had from the permanent secretary at any time.

Special attention is called this year to life membership as a convenient means for making a permanent contribution to the advancement of science. The number of life members is increasing rapidly in recent years. For persons not too advanced in years this form of membership safely constitutes a very productive form of investment, considered on an actuarial basis. For all persons it constitutes an excellent way to make a real and lasting contribution to the work of the association. All who can possibly do so should become life members. The fee is only one hundred dollars, which is within the reach of all who read this announcement.

SPECIAL PRIVILEGE FOR MEMBERS OF AFFILIATED SOCIETIES

Any member of a society officially affiliated with the American Association may become a member of the latter without paying the usual entrance fee of five dollars if he makes application before the second annual meeting following his entrance into the society. Also, members of recently affiliated societies may join the association without paying the entrance fee, if they do so before the second annual meeting following the affiliation. This special privilege is open to *all members* of the following affiliated societies:

American Electrochemical Society
American Ceramic Society
National Education Association
Mineralogical Society of America
American Society of Plant Physiologists
American Public Health Association
American Society of Parasitologists
History of Science Society
Honor Society of Phi Kappa Phi
Institute of Radio Engineers.

Members of the American Society of Parasitologists, the History of Science Society, the Honor Society of Phi Kappa Phi, and the Institute of Radio Engineers have until the close of the Philadelphia meeting (January 1, 1927) to accept this offer, while members of the other societies listed above have only until the close of the Kansas City meeting to take advantage of the special privilege.

Those who wish to omit the payment of the entrance fee should use a blue membership application card and mail it to the permanent secretary's office, together with their annual dues ($5), or present card and dues in the registration room at the Aladdin Hotel.

BUSINESS SESSIONS AT KANSAS CITY

The members of the executive committee of the association, the secretaries of the sections and the

secretaries of the societies that meet with the association this year will dine together at Kansas City on the evening of Sunday, December 27, at 6:30. The evening will be devoted to the secretaries' conference on various affairs of the association and its relation to the associated organizations.

The executive committee will hold its first Kansas City session in the permanent secretary's consulting room in the Muehlebach Hotel, on Monday forenoon, December 28, at 10 o'clock. Matters to be considered by the committee or by the council should be transmitted to the permanent secretary at the Washington office, so as to arrive by December 20.

The council of the association will hold its first session in the council room at the Muehlebach Hotel on Monday afternoon, December 28, at 2 o'clock.

Other meetings of the council will probably occur in the council room at 9 o'clock on Tuesday, Wednesday, Thursday and Friday mornings.

Other meetings of the executive committee will probably occur in the permanent secretary's consulting room at 10 o'clock on Tuesday, Wednesday, Thursday and Friday mornings.

Special attention is called to the rule that business to come before the council must regularly be first considered by the executive committee.

FURTHER ANNOUNCEMENTS AND REPORTS OF THE MEETING

Later announcements about the Kansas City meeting will be made in SCIENCE. Full information will be contained in the General Program, which will be available in the registration room at Kansas City on the morning of Monday, December 28. A copy of the program will be mailed free to each member who requests it, provided that every such request reaches the permanent secretary at the Washington office of the association before December 21.

It is planned that a general report of the Kansas City meeting will appear as a special issue of SCIENCE about February 1st. This is to contain reports on the main general features of the convention, the business transacted, and especially a full series of readable reports on the section and society programs, the latter reports based on material to be supplied by the secretaries of those organizations. All new members who join the association before the time of its publication will automatically receive the special issue of SCIENCE.

BURTON E. LIVINGSTON,
Permanent Secretary

SCIENTIFIC EVENTS

THE NORWEGIAN EXPEDITION TO SPITZBERGEN AND BEAR ISLAND

THE *Geographical Journal* gives a description of the principal results of the Norwegian expedition to Spitzbergen and Bear Island carried out during the past summer under the leadership of Dr. Hoel, whose previous labors in the same field have added greatly to our knowledge. In Spitzbergen the sphere of operations lay in the south central part of the West Island, between Van Mijen Bay and Ice fiord, and four parties took the field with a view to completing the survey of the eastern part of the coal-bearing tract in this region. As the country is covered with ice and snow transport was a matter of difficulty, the parties being equipped for the whole summer and each having a kit weighing some 1,000 kilograms; depôts laid out by the Store Norske Company were however of considerable help. Two of the parties set out from Sassendal, and two from Braganza Bay, and they met halfway. They were fortunate enough to effect a connection with the Russian survey points on Stor fiord. Dr. Hoel, Dr. Braastad, and Mr. Orwin carried out geological work slightly further west, and the last-named made the interesting discovery of the skeleton of a giant lizard of Jurassic age, found partly imbedded in shale. No such complete remains had ever been found in Spitzbergen. In the absence of suitable implements for digging out the remains, it was necessary to leave them till another occasion. On the peaks at Van Mijen Bay Dr. Braastad examined remains of fossil trees of Tertiary age. There were large trunks and smaller pieces not so well preserved, and it seemed as if regular lumbering had been carried on. Although the expedition worked in what are considered the best reindeer districts in the country, only eight or ten animals were seen, so that the stocks must have greatly diminished, and there is urgent need of protection. Work was also done on Bear Island by Messrs. Horn and Marstrander, who, besides boring for coal, investigated occurrences of galena in the south-east of the island. It has been proved that mixed seams of sulphate of barytes and galena occur, and that there is one pure seam of galena 30 to 40 centimeters thick, so that the prospects of working it with success are thought to be good. At sea, Captain Hermansen and other officers of the *Farm* carried out soundings and other oceanographical observations. The inner part of Ice fiord was sounded, and data collected for completing the chart of the waters between South Cape and Cross Bay on the scale of 1/100,000. Temperature observations gave the remarkable result that at

nearly all depths the water was warmer than in 1924 by 2 to 3 degrees, even though the temperature was very high last year. The air temperature was also high, and whereas winter minima of −48° to −50° were formerly recorded, last winter the lowest was scarcely −30°. It was mild also during the summer, and the glaciers are rapidly diminishing both in length and thickness, so that mountain ridges emerge. Lastly, information is given as to the present position of the coal industry. The Norwegian company continues to work full time, while the Dutch are at present contenting themselves with the erection of works. Much time has been lost by the Swedes owing to a fire in their mine, now extinguished. The Anglo-Russian Company is continuing its operations, and gets good prices on the Murman Coast.

THE NOBEL PRIZES

ACCORDING to press dispatches from Stockholm the board of directors of the Nobel Prize fund has, for the first time since the first prizes were given twenty-four years ago, decided to withhold all five of the prizes for this year. The reasons for this unprecedented decision is stated to be partly because of lack of qualified candidates and partly because of need for funds for the Nobel Library and the Physical and Chemical Institute, both founded in Stockholm by Alfred Nobel as part of his memorial.

Previous press dispatches had stated that high taxation in Sweden, an indirect consequence of the war, was imperiling the continuance of the Nobel prizes. It was said that the Nobel prizes in 1901 amounted to 709,234 crowns (about $177,600), and the taxes were 88,042 crowns (about $22,000). In 1923 the prizes had shrunk to 574,676 crowns, but the taxes had risen to 578,006 crowns, exceeding the income of the funds. For this reason the Nobel family has petitioned the Stockholm government to exempt the prize foundation from taxation. Their petition is receiving the support of the Swedish newspapers, scientists, literary men and the public generally.

In previous years prizes in one or more of the individual classifications have been withheld, but this is the first time that it has been decided to award none of the five. The five prizes are physics, chemistry, medicine or physiology, literature and the Nobel peace prize.

The Swedish Academy of Science awards the first two; the Stockholm Faculty of Medicine the third; the Swedish Academy of Literature awards the literature prize, and the peace prize is awarded by a committee of five elected by the Norwegian Storthing.

It has been announced that the 1924 physics prize to Professor Siegbahn was in recognition of his important discoveries in the X-ray spectra of the elementary substances.

PLANS FOR INCREASING THE ENDOWMENT OF THE SMITHSONIAN INSTITUTION

THE Board of Regents of the Smithsonian Institution has made the following announcement concerning the proposed $10,000,000 increase to the institution's endowment:

The board of regents of the Smithsonian Institution announces its decision to go before the American people to raise an addition of $10,000,000 to the institution's endowment for fundamental scientific research and publication. Since its foundation in 1846 the Smithsonian's initial endowment has only doubled, and its annual income of $65,000 has been for years inadequate to maintain its many and varied investigations and publications. Since the war, particularly, the rise in costs has materially cut down those activities, suspending some publications such as the "Contributions to Knowledge" series, cutting others to a third of what they were, and restricting the prosecution of such essential researches as that of Dr. Charles G. Abbot on the sun and its influence on the weather.

At the present moment lack of funds prevents the institution from undertaking sixteen major projects for research. Many of these projects are of immediate importance. Some of them, for example, will lead to an increase in the food supply from the sea, others will furnish data whereby the hardwoods, the fruits, the food, drug, oil and cordage plants of the Philippines will become increasingly available, while a third group will provide formulae to assist the engineer in solving the increasingly complex problems which face him.

The economic importance of such projects as these needs no demonstration. Nevertheless they are, like practically all of the Smithsonian's work, investigations in the field of pure research. They will form the groundwork for the applied scientist. Consequently, they are in the main investigations which will not be promoted unless the Smithsonian promotes them. For that reason the board of regents has determined to ask for an additional $10,000,000 to the institution's endowment.

The regents recognize the fact that the public will be surprised to have the Smithsonian turn to it for funds rather than to the government. But that surprise arises from a common misconception of the institution's position. It is not a government bureau. It was privately founded and privately endowed; it is privately directed and privately financed.

It sprang from the bequest of James Smithson, an English scientist, who never set foot in this country. In 1826 he willed his fortune of $550,000 *in trust* to the United States for "the increase and diffusion of knowledge among men." Organized in 1846, the Smithsonian began at once making geological, botanical, zoological and ethnological studies of various sections of the continent, col-

lecting specimens and information in all these fields. It financed this work from its own private funds. In 1858 the collections had become of such importance to the public welfare that congress felt a responsibility for their upkeep and it charged the Smithsonian with the expenditure of an appropriation to that end. Later congress incorporated these collections into the U. S. National Museum, but the Smithsonian Institution carried the major share of the burden of caring for them from its private income till 1870.

Subsequently, from time to time, the government recognized that nine other outgrowths of Smithsonian researches had become public necessities and appropriated for their support also, but never has it made any grants for research directly to the Smithsonian. The institution finances its research work from its private income and by gifts for special investigations.

As to the administration of the Smithsonian Institution, that is in the hands of a permanent secretary, elected by the board of regents, in cooperation with the executive committee of the board. The board, composed of the chief justice, the vice-president, three senators, three representatives and six private citizens, all acting in a private capacity, exercises oversight. The government is the trustee or guardian of the institution. Thus, because of its organization and the private nature of its funds, the Smithsonian is divorced from political influence.

Although the institution has never before called upon the public to aid in its researches, it has frequently been the beneficiary of gifts from private individuals, including the Hodgkins endowment of $200,000 for research and the Freer bequest of oriental and American art collections, of a gallery to house them, and a large income to increase them and diffuse knowledge of Asiatic art.

THE CHANDLER MEMORIAL MEETING

A MEMORIAL meeting to the late Professor Charles F. Chandler was held in Havemeyer Hall, Columbia University, on November 16. The meeting was held in Professor Chandler's old lecture room at Columbia, where he for more than half a century had served as teacher and administrator. Organizations participating were Columbia University, The Chemists' Club of New York City, The New York Section of the American Chemical Society and The American Section of the Society of Chemical Industry. Many distinguished men of science attended.

President Nicholas Murray Butler presided, saying "that the aim of the gathering should be the perpetuation of Professor Chandler's influence and example. We are here not to express the sorrow that was in our hearts when the long life of Professor Chandler came to an end, but rather to sound a note of triumph for his enduring leadership."

Professor Michael I. Pupin spoke on "Chandler: The teacher and the chemist," declaring that Chandler was the apostle of chemical science in the City of New York. "The marvelous success of the American Chemical Society," asserted Professor Pupin, "was always a source of endless joy to Chandler's heart."

Dean George B. Pegram, of the Columbia Schools of Mines, Engineering and Chemistry, discussing "Chandler and the school of mines," said that "Chandler's deeds kept in memory will lead others his way."

Elihu Root spoke on "Chandler: The man and the public servant," characterizing him as one of the most effective crusaders of his time in behalf of the public good. Many evils, Mr. Root said, were successfully attacked by Chandler, who was the original leader of the great movement for tenement house reform and who first as chemist and later as president of the Metropolitan Board of Health laid the basis for the existing health system of New York City.

Adulterated milk, sales of kerosene without inflammability tests and slaughter houses operating contrary to municipal regulations were other nuisances combatted by Chandler, whose human qualities were praised by Mr. Root as scarcely less influential than the concentrated ability with which he prosecuted a prodigious activity covering an unusually long life.

SCIENTIFIC NOTES AND NEWS

SIR ERNEST RUTHERFORD, Cavendish professor of physics at the University of Cambridge, has been nominated to succeed Sir Charles Sherrington as president of the Royal Society.

DR. JAMES F. NORRIS, president of the American Chemical Society, was honored by the Northeastern section of the society on the evening of November 13, when as a guest of the section he was tendered a banquet and reception at the Massachusetts Institute of Technology and then, after delivering an address, was presented with an engrossed testimonial of appreciation for his services as president of the society.

COLGATE UNIVERSITY, in convocation on Alumni Day, November 13, conferred the degree of doctor of laws upon Albert Perry Brigham, who now retires from active teaching after thirty-three years as professor of geology.

DR. THEODORE LYMAN, Hollis professor of mathematics and natural philosophy at Harvard University, will retire on July 1 next. Professor Lyman will continue as director of the Jefferson Physical Laboratory.

PROFESSOR FORRIS J. MOORE has retired from the staff of the Massachusetts Institute of Technology after thirty-one years of service.

AT the recent annual meeting of the National Malaria Committee, held at Dallas, Texas, Dr. L. O. Howard was elected honorary chairman of the committee, to succeed the late Dr. Henry Rose Carter.

who had held this office virtually since the foundation of the committee.

ON the occasion of his recent visit to Buenos Aires, Professor Albert Einstein was elected an honorary member of the Argentine Academy of Science.

DR. HANS VON EULER-CHELPIN, professor of chemistry at the University of Stockholm, and Dr. Paul Meyer, of Karlsbad, have been elected foreign members of the Kaiser-Wilhelm Institute of Biochemistry in Berlin.

PROFESSORS PAUL APPELL and Emile Picard, of Paris, have been elected honorary members of the Russian Academy of Sciences.

THE medals awarded to Professors Heitz-Boyer, Pasteur Vallery-Radot and Mathé, Paris, by the Cuban Academy of Sciences were presented to them recently by Professor M. Fernández, president of the academy, at a banquet at the Paris-Latin America Club.

THE Beal medal, awarded for the best technical paper presented at the 1924 meeting of the American Gas Association, has been presented to Dr. Ralph L. Brown, of the United States Bureau of Mines, for his paper on "Gummy deposits in gas meters—causes and prevention."

SAMUEL L. N. NICHOLSON, assistant vice-president of the Westinghouse Electric Manufacturing Company, received the first award of the electrical manufacturers' medal and purse under the James H. McGraw award on November 10, at the annual banquet of the Associated Manufacturers of Electrical Supplies which took place in New York City.

WILLIAM L. ABOTT, chief operating engineer of the Commonwealth Edison Company, of Chicago, has been elected president of the American Society of Mechanical Engineers, in succession to Dr. William F. Durand, professor emeritus at Stanford University.

PROFESSOR ALAN M. BATEMAN, of the department of geology of Yale University, recently took over the active editorship of the *American Journal of Science*, now in its 108th year. Several changes for the betterment of the journal have been introduced by Professor Bateman.

D. MONROE GREEN, formerly with the U. S. Bureau of Animal Industry, has been transferred to the Bureau of Biological Survey as assistant in the division of fur resources, and will devote much of his time to the rabbit industry.

DR. MYNIE G. PETERMAN, associate in pediatrics, Mayo Clinic, Rochester, Minn., has accepted the position of director of laboratory and research at the Children's Hospital, Milwaukee.

PROFESSOR BRADLEY M. DAVIS, of the department of botany at the University of Michigan, has been granted a leave of absence for the next semester. He will go to Jamaica where he will study the varied conditions of the island's vegetation, the tropical rain forests and desert regions and the coral reefs.

PROFESSOR M. S. SHERRILL, of the department of chemistry at the Massachusetts Institute of Technology, has been granted a leave of absence from the institute until next fall. He will go to Pasadena, Calif., to write a book in conjunction with Professor A. A. Noyes.

DR. AUSTIN M. PATTERSON, professor of chemistry at Antioch College, has returned from a six months' absence in Europe, during which he attended meetings of the international committees on organic and inorganic chemical nomenclature and was a delegate of American organizations to the International Conference on the Use of Esperanto in the Pure and Applied Sciences in Paris, the Conference of the International Union of Pure and Applied Chemistry in Bucharest, and the Congress of Industrial Chemistry in Paris.

DR. H. J. HANSEN, chief of the medical statistical office of the National Board of Health, of Denmark, is visiting the United States under the auspices of the International Health Board.

DR. SVEDRUP, in charge of the Amundsen scientific Arctic expedition, has returned from a three years' stay in the Arctic region north of Siberia and recently visited the Astrophysical Observatory in Washington.

DR. WARREN H. LEWIS, professor of physiological anatomy, Johns Hopkins Medical School, will deliver the third Harvey Society lecture at the New York Academy of Medicine on Saturday evening, December 12, at eight thirty. His subject will be "On the origin of macrophages and epitheloid cells from mononuclear blood cells."

DR. ARTHUR L. DAY, director of the Geophysical Laboratory in Washington, gave an illustrated lecture on the Santa Barbara earthquake at the Carnegie Institute of Washington on November 24.

DR. GEORGE P. MERRILL, of the United States National Museum, will give a series of four public lectures on meteorites at Harvard University, under the auspices of the department of geology, on December 8, 9, 10 and 11.

DR. WILLIAM H. HOBBS, of the University of Michigan, addressed a joint meeting of the Washington Academy of Sciences and the Geological Society of Washington on November 19, on the subject of "The glacial anticyclones: The poles of the atmospheric circulation."

DR. F. O. BOWER, professor of botany in the University of Glasgow, gave an illustrated lecture on the "Phylogeny or natural classification of the ferns," at Columbia University on November 24.

DR. E. E. SLOSSON, director of Science Service, gave a public lecture on "Chemistry and human welfare" on November 9, under the auspices of the University of Chicago. The lecture was preceded by a brief address by Professor Stieglitz on "The Science of chemistry," illustrated by a few experiments.

A MEMORIAL service for Professor James Crosby Chapman, of Yale University, who was drowned in Lake Chautauqua on July 15, was held in Battell Chapel recently. President James Rowland Angell presided and addresses were made by Professor George S. Counts and Professor Luther A. Weigle.

THROUGH the interest of Professor William Trelease, who had personal relations with three generations of the distinguished botanists commemorated, the City of Geneva has marked their one-time residence at no. 3 Cour de St. Pierre with a tablet bearing the following inscription:

Ici ont vécu et travaillé pendant un siècle
Les botanistes genevois
Augustin-Pyramus de Candolle
1778–1841
Alphonse de Candolle
1806–1893
Casimir de Candolle
1836–1918
Augustin de Candolle
1868–1920

DR. WILLIAM EMORY STUDDIFORD, director of the Sloane Hospital for Women and professor of obstetrics and gynecology in the College of Physicians and Surgeons, Columbia University, died on November 17, in his fifty-ninth year.

DR. HAROLD W. NICHOLS, chief engineer in charge of radio research work for the Bell Telephone Laboratories, died on November 16, at the age of thirty-nine years.

DR. J. N. LANGLEY, professor of physiology at the University of Cambridge, died on November 5, in his seventy-third year.

DR. HENRY JACKSON WATT, reader in psychology at the University of Glasgow, recently died, aged forty-six years.

DR. O. VAN DER STRICHT, the Belgian biologist who recently lectured at various universities in this country, has died.

DR. KARL ZSIGMONDY, professor of mathematics at the Vienna School of Technology, has died, aged fifty-eight years.

JOHN K. HILLERS, formerly of the United States Geological Survey, died on November 14, aged eighty-two years. A correspondent writes that the death of Jack Hillers removes a member of the few survivors of the early personnel of the U. S. Geological Survey. He was a photographer and accompanied Major J. W. Powell in his western journeys, notably in the wonderful voyage down the Grand Canyon in 1873. For a long time, later, he was in charge of the Photographic Laboratory of the U. S. Geological Survey in Washington. His numerous large photographs of notable western geologic features were not only of highest technical quality, but admirable in lighting and composition. They have been used extensively for illustrating geologic reports and text books, for transparencies and for lantern slides, which have been of great value to teachers of geology in this and other countries.

THE seventh annual meeting of the Southwestern Division of the American Association for the Advancement of Science will be held at Phoenix, Arizona, on February 15, 16, 17 and 18, 1926. The president of the division this year is Professor T. D. A. Cockerell, of the University of Colorado.

THE annual meeting of the American Psychological Association will be held from Monday to Wednesday, December 28, 29 and 30, in Goldwin Smith Hall at Cornell University, Ithaca. Because of the increased pressure for places upon the program, the program committee will continue the practice of holding sessions on the afternoon of the third day of the meetings. So far as possible papers of general and theoretical import will be placed in the session of Monday, December 28. The business meeting will be held on Tuesday evening. In place of an afternoon session devoted to a symposium, the program committee hopes to schedule a sufficient number of round table conferences to occupy Tuesday afternoon. The annual dinner of the association, followed by the presidential address and smoker, will be on Tuesday evening. Wednesday, December 30, will be devoted to sessions of the section of clinical psychology. The official headquarters of the association will be at Prudence Risley Hall on Thurston Avenue. Accommodations for most, if not all, members may be had there.

A HUNDRED years ago on November 3 the Hungarian Academy of Science was founded as the result of the efforts of Count Stephen Széchenyi. A distinguished company of Hungarians and foreign vis-

itors attended a ceremony held to mark the occasion in the academy building in the public garden facing which stands a statue of Count Széchenyi, among them being the regent, Admiral Horthy, and scientific men from many nations. The president of the academy delivered a speech in which he reviewed the literary achievements of the past century.

A NEW society for physical anthropology has been founded in Germany under the chairmanship of Professor Aichel-Kiel. According to *Eugenical News*, on motion of Professor Aichel, Professor E. Fischer, of Freiburg, was elected president, and Dr. W. Gieseler, secretary. The new society will work in harmonious relations with the old "Gesellschaft für Anthropologie, Ethnologie und Urgeschichte" but will support more especially physical-anthropological investigations in Germany. The first meeting of the new society will take place at Easter time, 1926, simultaneously with the anatomical meeting in Freiburg.

ACCORDING to the *Electrical World* a series of meetings was held in Cleveland by a number of the committees of the American Society for Testing Materials on October 27, 28 and 29. The committee on electrical insulating materials, of which F. M. Farmer, chief engineer of the Electrical Testing Laboratories, New York, is chairman, received reports from subcommittees on insulating varnishes, molded insulating materials, porcelain, sheet insulation, liquid insulation, cable splicing and pothead compounds, and radio frequency tests. All these committees reported experimental progress. A new committee on metallic materials for electric heating was appointed, with Dean Harvey, of the Westinghouse Company, as chairman, and five subcommittees will deal, respectively, with life tests, physical and electrical tests, chemical analysis, standard sizes and packages, and application of data. It will be the first time that a fundamental study of this field has been made by producers and consumers of such material working together. Other committees which met were those on coal and coke, corrosion of iron and steel, rubber products, and the effect of temperature on the properties of the metals.

THE sum of 50,000 liras has been presented to the medical faculty at Florence by physicians in Argentina to found the Guido Banti prize. The income from the endowment is to be awarded for the best original Italian work on pathologic anatomy.

THE Yale Corporation has forwarded to the University of the Witwatersrand, South Africa, resolutions thanking the officers and board of trustees of that university for their cooperation in the erection of the new Yale Astronomical Observatory in South Africa.

UNIVERSITY AND EDUCATIONAL NOTES

CORNELL UNIVERSITY has received an anonymous gift of $250,000, the income of which is to be used for the "benefit and advancement of teaching and research in chemistry." A second gift of $500,000 has been made by an anonymous donor, subject to a life interest. The income of the fund is to be at the unrestricted disposal of the trustees, the donor expressing a wish that it be used for the benefit of the college of engineering.

AS a contribution from Rush Medical College Alumni to the development fund of the University of Chicago, a committee of physicians throughout the country has been organized, under the leadership of Dr. Ralph W. Webster, Chicago, to raise $250,000.

AT Purdue University Dr. A. R. Middleton has been appointed acting director of the department of chemistry following the resignation of Dr. E. G. Mahin. Dr. M. G. Mellon has succeeded Dr. Mahin as professor of analytical chemistry.

DR. G. N. QUAM, formerly professor of chemistry in Midland College at Fremont, Nebr., has accepted a position as head of the department of chemistry at Coe College, Iowa.

ELMER O. KRAEMER, National Research Fellow in colloid chemistry, has been appointed assistant professor at the University of Wisconsin.

HENRY SCHMITZ, of the University of Idaho, has been appointed head of the forestry department at the University of Minnesota.

PROFESSOR J. A. S. WATSON, professor of agriculture and rural economy at the University of Edinburgh, has been appointed to the Sibthorpian chair of rural economy in the University of Oxford.

A CHAIR of oto-rhino-laryngology has been founded at the Toulouse Faculty of Medicine, with Dr. Escat as its first occupant.

DR. WALTHER BORSCHE, head of the department of chemistry at the University of Göttingen, has been appointed to a similar position at the University of Frankfurt.

DISCUSSION AND CORRESPONDENCE

WAS THERE A PACIFIC CONTINENT?

DR. ALFRED O. WOODFORD has recently demonstrated[1] that a large volume of sediments in Southern California, the San Onofre Breccia, is composed exclusively of rocks and minerals which must have come from the west. The minerals are such as are not

[1] University of California Publications, Bull. Dept. Geol. Sci. Vol. 15, No. 7, pp. 159–280, 1925.

found to the eastward any place, from which they could have been transported to their present position. The age of this breccia was determined to be Miocene and probably the equivalent of a portion of the "Monterey."

The size of this westward land mass, now submerged, except for portions of the "Channel Islands," must have been considerable, although the exact boundaries may never be known. Many of the fragments of which the breccia is composed are large and angular, but the indications are that there were streams flowing eastward.

This work, supported by exact petrographic studies, adds still another link to the chain of evidence which has been accumulating and which demonstrates almost beyond contention the existence to the westward of North America of a land mass of probably continental size. The eastern boundary of this land probably disappeared or at least was greatly lowered in elevation at the close of the Miocene epoch. During that long period of geologic time there accumulated in what is now California enormous thicknesses of sediments composed very largely of the skeletons of microscopical organisms. Some measured sections of this deposit are over 8,000 feet thick. The preponderance of these organisms over clays, sands or other materials derived from erosion of land areas demonstrates that the climate of the region throughout the period of deposition was one of great aridity. A logical explanation for this aridity exists in the supposition of a mountain range to the westward of the present shore line which cut off the moisture, just as to-day the coast ranges cause desert conditions to appear in the interior valleys of California.

The close of the Miocene was marked by an abrupt change in the features of sedimentation: micro-organisms became relatively scarce and clastic materials derived from land masses made up the greater part of the deposits. It would therefore seem that the cause of the great aridity during the Miocene was suddenly removed and a period of much precipitation followed. A lowering of this offshore Pacific mountain barrier would probably produce just such a result.

Of course great aridity at a given place is not necessarily dependent upon an outlying offshore barrier, as the climate of the coastal region of Chile and Peru abundantly proves, but in the California region that appears to be the most reasonable explanation.

Other evidence pointing toward the existence of a land area to the westward of the present shore line is found in the existence here and there of isolated "islands" composed of granite rocks. The Farallon Islands, the tip of Point Reyes Peninsula and Point Pinos near Monterey are some of these areas, far removed from any similar rocks. Granite is generally considered to belong exclusively to the continental land masses. Farther to the south, off the west coast of Mexico, there is a larger mass of the same rock, forming the Cape Region of Lower California. Also one of the discoveries made by the California Academy of Sciences Expedition in 1925 was a granitic core in Maria Madre Island. Likewise, sixty miles west of Socorro Island, one of the Revillagigedo group, there is an isolated menace to navigation, called Roca Partida. The walls of this are perpendicular and landing was impossible, but from a row boat the rock had every appearance of being composed of granite.

Can all these points be the last remnants of a continent which existed when much of Central America and California were submerged? It certainly looks as if this question might be answered in the affirmative with very little qualification.

G. DALLAS HANNA
CALIFORNIA ACADEMY OF SCIENCES

ULTRA-VIOLET LIGHT AND ANTI-RACHITIC VITAMIN IN THE HENS' EGGS

IN concluding their article on "The influence of ultra-violet light on leg weakness in growing chicks and on egg production,"[1] Hughes, Payne and Latshaw state: "The variation in the hatchability of the eggs produced by hens receiving varying amounts of ultra-violet light is perhaps due to a variation in the anti-rachitic vitamin content of the egg. This is merely an assumption but points the way to some very interesting research work." This year experiments have been completed in which the relative anti-rachitic vitamin content of eggs from hens receiving different amounts of ultra-violet light has been determined and, as predicted last year, the hens which receive an abundance of ultra-violet light are able to put an abundance of the anti-rachitic vitamin in their eggs, while the hens which receive a very limited amount of ultra-violet light are able to put only a small amount of the anti-rachitic vitamin in their eggs.

In this experiment eggs from four pens of hens receiving varying amounts of ultra-violet light were tested by feeding the eggs to growing chicks. These four pens of hens were housed in a shed-roof type house with a south exposure. Each pen was eight feet by ten feet and had a glass window in the south side three feet by eight feet. Pens 1 and 3 were allowed a run to the south of the house, where they had access to direct sunlight. The windows in Pens 2 and 4 were kept closed at all times, so all the sun-

[1] *Poultry Science*, Vol. IV, No. 4, April-May, 1925.

light received by these pens was filtered through glass. Pens 1 and 2 received a thirty-minute treatment of ultra-violet light each day from a quartz mercury arc lamp. In this way Pen 1 received both the direct sunshine and ultra-violet light from the mercury arc lamp. Pen 2 received sunlight filtered through glass and light from the mercury arc lamp. Pen 3 received direct sunshine, while Pen 4 received only the glass-filtered sunshine. The hens were placed on the experiment October 1, 1924, and the experiment to determine the relative vitamin content of the eggs was begun six months later, April 1, 1925.

Four lots of growing chicks were used to test the relative anti-rachitic vitamin content of the eggs from these four pens of hens. These pens of chicks were kept in the nutrition laboratory on a basal ration and under conditions which would cause them to develop rickets in about four to six weeks. In addition to this basal ration each pen of twelve chicks received one egg a day from one of the pens of hens. Pen 1 of chicks received an egg each day from Pen 1 of hens, etc. This feeding experiment was continued for eight weeks at which time the chicks in each lot were killed for chemical analyses. The chicks in Pens 1 and 3, which received eggs from hens receiving direct sunshine, developed normally as shown by their general appearance as well as by chemical analyses of their blood and bones.

The chicks in Pen 2, which received the eggs from the hens that received sunlight filtered through glass and a thirty-minute exposure to the mercury arc lamp, developed some rickets; but they were in much better shape than the chicks in Pen 4, which received eggs from the hens that received no ultra-violet light except that which came through the glass window.

This test with the growing chicks has been repeated a second time with results in agreement with the first trial. From these results we conclude that the anti-rachitic vitamin content of eggs will vary with the amount of ultra-violet light the hens receive when their feed is low in this substance.

In this experiment the eggs from Pen 1 hatched 67 per cent.; Pen 2, 72 per cent.; Pen 3, 75 per cent.; and Pen 4, 53 per cent. These results, as well as the results we obtained last year, indicate that the anti-rachitic vitamin content of eggs is one factor in the development of a strong vigorous chick. Cod-liver oil at the rate of ½ cc per hen per day produced eggs which hatched as well as those from hens receiving direct sunshine.

J. S. HUGHES
R. W. TITUS
J. M. MOORE
KANSAS STATE AGRICULTURAL COLLEGE

ANENT THE "HARMLESS" CORAL SNAKE

THE coral snake is poisonous, but not vicious. Two of the largest dealers in live snakes of the south and southwest know them to be poisonous from personal experience and are so cautious that they handle mimic scarlet king snakes with the same care. In spite of the fact that we have captured, studied and photographed alive about every species of snake from Georgia to Arizona, we nevertheless almost unconsciously use the same extreme caution with several species of non-poisonous scarlet king snakes.

It is true that one very rarely encounters authentic cases of fatal coral snake bite. It would, however, be unwise to call the species harmless. For example, in Georgia, one of our party who was barefooted stepped on a cottonmouth in the water. The same day he reached into a wood rat's nest and, when he withdrew his hand, a cottonmouth presently came out of the nest. In neither case was he bitten. Nevertheless, he respects this snake as poisonous and will never again stick his hand in such a nest. In July and August, 1925, we saw two men who handle and have handled more gila monsters than any one else in the U. S. A. Both were bitten this summer by gila monsters with no bad effects, yet these gentlemen respect these poisonous reptiles. They feel it was their good fortune to escape. Like many of us, they do not consider these creatures vicious and make pets of them.

The coral snake is a burrower, is secretive and is most active at night or after rains. The collector or the average individual seldom encounters it. It is not vicious. One example will suffice. On the 75-mile practice-march of the five thousand U. S. soldiers from Ft. Sam Houston this summer, one soldier picked up a pretty snake. He and his fellows treated it as a pet for two or three days. In the end he asked the Y. M. C. A. director to care for it. This gentleman did and asked me for its identification one week later. Many Y. M. C. A. men for a week played with it. None of these were bitten. This coral snake was good-natured, yet potentially very poisonous.

The coral snake, as Professor Dunn contends, can open its mouth wide enough to bite a human being. We had one captive coral snake, which frequently opened its mouth a few days previous to its approaching death. Also one evening about 8:30 P. M. (darkness) my wife discovered a coral snake at the ranch gate. The instant we laid a stick on it, it resisted capture with great vigor, and constantly opened its

mouth in defense. No individual, scientist or layman could play loosely with the open mouth of that snake.

A. H. WRIGHT
CORNELL UNIVERSITY

ADDITIONAL evidence for the poisonous character of the coral snake has recently been given by the professor and students in the summer forestry school of the Louisiana State University at Bogalusa, Louisiana. To those of us who live in the territory of the coral snake it seems extremely important that the poisonous nature of this snake be emphasized whenever and wherever possible.

The article by E. R. Dunn, of Smith College, in SCIENCE for October 2, is thus further reinforced by the following facts:

A beginning student in the forestry school of the State University at Bogalusa, Louisiana, was bitten at eight o'clock in the morning by a snake which he believed to be non-poisonous. The professor in charge helped other students apply a tourniquet and sent the boy at once to the nearest hospital. The physician who looked at the wound treated it as one would any other, removed the tourniquet and sent the boy home. By three o'clock that afternoon the boy was feeling so ill that his family sent for the best physician available. The doctor saw that a slow paralysis was already setting in and ordered the boy to the hospital. But in spite of all that could be done the patient died before six the next morning. The wound was on the finger and though deep was certainly not of such a nature as to have produced death except from the venom. Subsequent comparison of the accounts of the onlookers (the snake unfortunately escaped) establishes as a practical certainty the identity of the snake as *Elaps*, our coral snake.

E. H. BEHRE
LOUISIANA STATE UNIVERSITY

NOMENCLATURE OF VITAMINES

FUNK'S proposal in the matter of the nomenclature of the vitamines[1] proves the desirability of an international agreement.

The term D accepted by Funk for the designation of the yeast growth promoting factor is already used by others for the anti-rachitic factor.

This, however, is termed by Funk E; unfortunately, E is claimed by Barnett Sure to use instead of Ewan's and Bishop's substance X, or the reproduction factor, which in Funk's scheme is termed F!

E. C. VAN LEERSUM
DIRECTOR, NETHERLAND INSTITUTE OF NUTRITION, AMSTERDAM

[1] SCIENCE, 62, 157, 1925.

QUOTATIONS

INTERNATIONAL COOPERATION IN SCIENCE

ONE section of the work of the League of Nations which received prolonged consideration at Geneva during the recent assembly is that known as intellectual cooperation. A year ago the assembly authorized the establishment in Paris of an International Institute of Intellectual Cooperation, to be under the control of the league, but subsidized by the French government. The choice of Paris was criticized at the time because it suggested that France had some preeminence in culture, but ultimately the proposal secured something like unanimous approval. The institute has now been definitely constituted, and will be in full working order during the present year. The French government is supporting it at an estimated annual cost of two million French francs. The director is M. Julien Luchaire, inspector-general of public education in France and laureate of the French Academy. M. Luchaire a fortnight ago gave the delegates assembled at Geneva an account of what has been already done and what it is proposed to do. He said that the institute had been organized in seven sections—namely, general relations, university relations, bibliography and science, legal relations, literature, art and information. The chiefs appointed to these sections are, respectively, an Englishman, a Pole, a German, a Spaniard, a Chilian (a lady), a Belgian and an Italian. To the science section a very ambitious program is committed. In the first place, it will endeavor to organize an international analytical bibliography in all branches of science. So far as physics is concerned, a large number of reviews publish articles on this subject, and there are three reviews which prepare a fairly wide analytical bibliography, but hitherto these have competed uselessly with one another, while being individually incomplete. The Committee on Intellectual Cooperation has had a meeting with the directors of these three publications, and an agreement has been reached whereby, through a division of the work, physicists of all nationalities will have an opportunity of becoming fully and immediately informed of the immense production throughout the world in this branch of science. Another task before this section of the institute is to create a liaison between the libraries of all countries, particularly with a view to arranging specialized centers for the collection of scientific documents. A system for the international loan of books and the exchange of scientific publications is also to be brought into being. Investigations are to take place with a view to the set-

ting up of new international institutes of research, and measures likely to encourage young people devoted to scientific research are to be examined. Then the unification of nomenclature and of standards of measurement in certain sciences is to be attempted; a beginning has already been made with regard to the terms employed in nosology. Another task proposed is the diffusion by means of analytical summaries of scientific work performed by nationals in countries whose language is not widely known. Among the questions referred to the section charged with general affairs is the setting up of an organization for the preparation of youths for international careers. The question had already been considered by the committee on Intellectual Cooperation sitting at Geneva of the establishment of an international university or an institute of international studies under the auspices of the league, and now the Paris institute is to give the question a more detailed examination. A scheme for study tours and exchange of students of all countries has also been approved. Another proposal, from Rumania, is the flotation of an international loan for the restoration of science in certain countries, particularly those which suffered most severely from the war. The information section of the new institute is to examine questions concerning books—for example, the question of introducing uniformity of size and paper measure, and of undertaking a campaign against the use of papers and inks of inferior quality whereby the printed record is likely in course of time to be destroyed. M. Luchaire concluded his address with an eloquent tribute to M. Henri Bergson, who has been chairman of the Committee on Intellectual Cooperation since its foundation, but was unable to go to Geneva this year owing to ill health. He spoke of Bergson as a great citizen of the intellectual world who had devoted all his time during recent years to the work on intellectual cooperation, giving second place even to those philosophical speculations which had been his glory and his delight. A telegram of greeting and homage was sent to M. Bergson from the delegates at Geneva.—*British Medical Journal.*

SCIENTIFIC BOOKS

Introduction to Theoretical Physics. Volume I. By ARTHUR HAAS, professor of physics in the University of Vienna; translated from the third and fourth German editions by T. Verschoyle. Pp. xvi–331, D. Van Nostrand Company, New York, 1924. Price $6.00.

THE wonderful progress of physical science in recent years has made an understanding of the fundamentals of theoretical physics increasingly necessary for every physicist or physical chemist. While an introductory course on theoretical physics has been more or less standardized in continental universities since C. Christiansen's "Elements of Theoretical Physics" appeared in German translation in 1894, such a course is hardly yet universal in this country. This has been due, in part, to the lack of a suitable textbook in the English language. In view of this fact the appearance of an English edition of Professor Haas's book must be considered an event of great importance.

The object of this book is to give a survey of the fundamental principles of theoretical physics that will prepare the student for the study of original papers and monographs on modern physics. The first volume is devoted to classical physics and in it no use is made of atomistic hypotheses. It deals with the principles of mechanics, with the general theory of vector fields, of vibrations and of potential, and also with the theory of the electromagnetic field and of light. At the end of the volume is given a very useful summary. The second volume will take up atomistic and non-classical physics.

The ground covered is treated with great clarity and pedagogical skill. Only a minimum of mathematical knowledge is assumed (even the process of differentiation is explained) and no steps are left out in the calculations. This feature makes the book particularly valuable for self-study. By placing the developments of all purely mathematical relations in separate sections their abstract and general character is emphasized and confusion avoided between mathematical form and physical contents. Systematic use is made of vectorial methods throughout the volume. With the thorough and complete development given of the general principles, it has, of course, been necessary to leave out examples and applications to special problems.

The reviewer has found only one real error in the book. On page 160 the stress in a deformable body is assumed to be a vector instead of a tensor, and the proof given for the symmetry of the stress tensor as well as the derivation of the surface-force acting on an arbitrary surface-element are therefore illusory.

A few of the sections on the theory of the electromagnetic field are less satisfactory than the rest of the book. The author, when applying the results from the chapter on potential theory to electromagnetism, has not always kept clearly in mind that these results are purely mathematical. It would also have been more natural to start with Biot and Savart's law, with which the student is already familiar, rather than with the general law for the magnetic field of a closed circuit.

The reviewer has used the first volume of the English translation, together with the second volume of the German edition, in a course for beginning graduate students, and has found it very satisfactory, especially when supplemented with problems and special readings. It is much to be desired that the translation of the second volume be not delayed.

J. RUD NIELSEN

UNIVERSITY OF OKLAHOMA

SPECIAL ARTICLES

THE STRUCTURE OF HIGH- (OR β-) QUARTZ[1]

AT temperatures below 575° C. crystals of quartz have the symmetry of the enantiomorphic hemihedral class of the rhombohedral division of the hexagonal system (point group 3D). An inversion takes place at this temperature, however, and above 575° C. the symmetry is increased to that of one of the truly hexagonal crystal classes. When α- (or low) changes to β-quartz a single crystal of the former becomes transformed into a single and similarly oriented crystal of the latter. This fact permits the investigation of the X-ray diffraction effects from single crystals as well as from crystalline aggregates of β-quartz.

Powder, Laue and spectrum photographs have been made from β-quartz in the course of a series of X-ray diffraction studies of crystals at elevated temperatures. The data from these photographs have been found to be sufficient to yield a unique solution to the problem of the atomic arrangement in this form of silica.

A print has been published of a Laue photograph[2] of quartz above its inversion point. Spectrometer measurements[3] from several simple planes have also been recorded. No structure, however, has been deduced from either of these earlier sets of observations.

Crystallographic measurements have shown β-quartz to have an axial ratio very close to that of α-quartz —$c_\beta = 1.0926$[4] as opposed to $c_\alpha = 1.0999$. The hexagonal unit cell of α-quartz which agrees with all attainable diffraction data has dimensions $a_o = 4.903$A°,[5] $c_o = 5.39_3$A° and contains three molecules of SiO_2. The only simple unit cell for β-quartz that can account for the data from powder photographs and from six Laue photographs is a similar one with $a_o = 5.01$A°, $c_o = 5.47$A°. Since the density[6] of β-quartz is known to be $\rho(585°) = 2.518$, its unit cell likewise must contain three molecules of SiO_2.

The hexagonal, rather than trigonal, symmetry of β-quartz is immediately apparent from the Laue photographs taken with the X-rays normal to the base (00·1). Since quartz above its inversion still shows rotary polarization, its class of symmetry must be either 6C or 6D. Crystallographic observations[7] have been supposed to point quite conclusively to the latter. If this selection of crystal class is assumed to be correct, the following deduction leads uniquely to a structure for β-quartz which is in satisfactory accord with experiment.

The X-ray diffraction effects arising from atomic arrangements built upon the space groups isomorphous with 6D differ in the nature of the reflections observed from the plane (00·1). The present powder and spectrum photographs from β-quartz agree with the previous spectrometer measurements in showing only 3rd, 6th, etc., orders from this face. Its corresponding space groups[8] consequently prove to be the enantiomorphic pair 6D–4 and 6D–5. There are numerous ways of arranging three silicon and six oxygen atoms according to the demands of these groups. All those structures which put oxygen atoms in special positions[9] (a)–(f) are excluded by the presence of first-order Laue reflections from planes (2m, 2n.p), where m, n, and q are any integers and $p \neq 3q$. The eight remaining structures are obtained by combining (a) and (c), as silicon positions, with (g), (h), (i) or (j), as oxygen positions. Four of these, (a)(g), (a)(i), (c)(g), and (c)(i) place the oxygen and silicon atoms in the same planes parallel to (00·1). If, then, one of these groupings were the correct structure, the observed 3rd, 6th, etc., orders from the base should show a "normal decline" of intensity with order. Both the spectrometer observations[10] and spectrum photographs indicate that

[1] A paper (*J. Soc. Glass Technology*, Sept., 1925) has just appeared in which W. H. Bragg describes a structure for β-quartz. His atomic arrangement seems to be essentially identical with the one deduced here.

[2] F. Rinne, "Die Kristalle als Vorbilder des feinbaulichen Wesens der Materie" (Berlin, 1921), p. 35.

[3] R. E. Gibbs, *Proc. Roy. Soc. A, 107*, 561 (1925).

[4] R. Grossmann quoted in F. Rinne, *op. cit.*, p. 89.

[5] M. Siegbahn and V. Dolejsek, *Zeit. f. Physik, 10*, 159 (1922).

[6] A. L. Day, R. B. Sosman, and J. C. Hostetter, *Am. J. Sci., 37*, 1 (1914).

[7] O. Mügge, *Neues Jahrb. f. Min.*, u.s.w. Festband, 1907, p. 181.

[8] P. Niggli, "Geometrische Kristallographie des Discontinuums" (Leipzig, 1919), p. 493; W. T. Astbury and K. Yardley, *Trans. Roy. Soc.* (London), *224A*, 221 (1924).

[9] These designations of atomic positions are the ones used in R. W. G. Wyckoff, "An analytical expression of the results of the theory of space groups" (Washington, 1922), p. 165.

[10] R. E. Gibbs, *op. cit.*

00·1(3) is not stronger than 00·1(6). These four arrangements may thus be excluded from further consideration.

Each of the four remaining possibilities (a)(h), (a)(j), (c)(h), and (c)(j) has only one variable parameter. It is consequently entirely feasible to calculate the nature of the diffraction effects to be expected from them for different values of the variable parameter u. A comparison of the results of such calculations with the principal aspects of the powder photographs and with the important intensity anomalies observed in the Laue photographs from β-quartz serves to eliminate all these structures except (c)(j). If in grouping (c)(j) the parameter u is chosen close to 0.20, then excellent agreement is found between calculated and observed intensities.[11]

It can hence be concluded that the structure of β-quartz is that of the two enantiomorphic arrangements 6D–4, (c) (j) and 6D–5, (c) (j). The coordinate positions of the atoms in the hexagonal unit of 6D–4, for instance, are

Silicon Atoms: (c) $\frac{1}{2}\ \frac{1}{2}\ \frac{1}{3}$; $0\ \frac{1}{2}\ 0$; $\frac{1}{2}\ 0\ \frac{2}{3}$
Oxygen Atoms: (j) $u\ \bar{u}\ \frac{5}{6}$; $2\bar{u},\ \bar{u},\ \frac{1}{2}$; $\bar{u},\ 2u,\ \frac{1}{3}$;
$\bar{u}\ u\ \frac{5}{6}$; $2u,\ u,\ \frac{1}{2}$; $\bar{u},\ 2\bar{u},\ \frac{1}{3}$,

where u has a value in the neighborhood of 0.20.

This structure agrees with the one deduced for β-cristobalite[12] in placing a tetrahedron of oxygen atoms about each silicon atom. In cristobalite this tetrahedron was necessarily regular; symmetry does not require such a regularity in quartz, but the value found for u is such as to bring about at least an approach to this condition. From data now being obtained through the analysis of prism face Laue photographs it is hoped to be able to limit the oxygen parameter more narrowly, and thus to gain a more quantitative measure of this approach to regularity. No molecules of SiO_2 could be distinguished in crystals of β–cristobalite; neither does this structure for β-quartz show clear evidence for SiO_2 or $(SiO_2)_x$ molecules.

Though their Laue photographs exhibit very different intensities of reflections, the powder photographs of α- and of β-quartz are astonishingly similar. This is precisely what would be expected if the change from one form of quartz to the other involves only a relatively slight atomic rearrangement. The numerous other known facts about quartz agree with this supposition.

A more detailed description of this structure, together with a statement of the extent to which it agrees with experiment, will be published in the *American Journal of Science*. This experimental evidence and a tabulation of the distinguishing criteria for all special cases of the hexagonal space groups will appear in the *Zeitschrift für Kristallographie*.

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[11] Arrangements (a) (h) and (a) (j) would not have been expected because they make the three silicon atoms all lie on a single axis and thus place them closer together than previous experience has indicated as probable; similarly (c) (h) is unlikely because it associates oxygen atoms more intimately with one another than with silicon atoms.

[12] R. W. G. Wyckoff, *Am. J. Sci.*, *9*, 448 (1925).

A NEW METHOD FOR THE STUDY OF SOFT X-RAYS[1]

A NEW method for determining ionization and resonance potentials is found and applied in determining such critical limits of the elements composing photographic emulsions. At this writing the soft X-ray region between 100 and 750 volts has been studied.

A beam of electrons, having velocities uniformly distributed over the range under investigation, is spread into a band by means of a magnetic field. The velocity possessed by the electrons in any given part of this band is determined from the geometry of the apparatus and the strength of the magnetic

TABLE I

Volts ± 2	ν/R	Interpretation
135	10	.....
173	12.8	Br; $4_1 \rightarrow 3_2$
184	13.5	Br; $4_1 \rightarrow 3_2$
193	14.25	Br; M_{III}
202	14.9	Br; M_{II}
255	18.8	C; Kα
265	19.6	Br; M_I
273	20.15	.....
282	20.8	.....
288	21.25	C; K absorption
306	22.6	K; L absorption
323	23.9	Ag; $4_2 \rightarrow 3_3$
333	24.6	Ag; $4_2 \rightarrow 3_3$
345	25.5	.....
350	25.85	.....
376	27.8	Ag; M_V, or N; Kα
384	28.4	Ag; M_{IV}
404	29.8	N; K absorption
440	32.5	.....
497	36.7	O; Kα
548	40.45	O; K absorption
562	41.5	Ag; $4_3 \rightarrow 3_2$
572	42.2	Ag; M_{III}
597	44.1	Ag; M_{II}
664	49.0	Ag; $4_2 \rightarrow 3_1$
695	51.2	.....
730	53.9	Ag; M_1
762	56.3	.....

[1] Preliminary report.

field. Photographic plates exposed to such a band show sharp discontinuities when developed.

The photographic emulsions contain the following elements which have critical potentials within the range studied: carbon, nitrogen and oxygen in the gelatin; and silver and bromine as silver bromide. The discontinuities observed in the blackening of the photographic plate are in good agreement with observed and calculated critical potentials for these elements. Table 1 contains a list of the critical potentials observed in this work with the interpretation assigned to each.

In assigning the interpretations given in this table both the absolute values and the difference between levels have been considered.

The authors do not wish to make any claims for attainable refinements, but it is obvious that such uncertainties as initial velocities of thermally emitted electrons, contact potentials and potential drops along filaments are eliminated.

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THE NUMBER AND ARRANGEMENT OF FLAGELLA OF THE TYPHOID FEVER GERM, BACILLUS TYPHI

IN staining various bacteria for flagella by a method developed by the writer (which will be described elsewhere), *Bacillus typhi* Gaffky (*B. typhosus* Gaffky) happened to be included. As quite a few preparations have been obtained of this germ, showing very clearly the number and arrangement of flagella, it seems desirable to call attention to the findings, especially as they are not in agreement with various statements and figures presented in quite a few well-known text-books and articles. Two cultures, at different times, were obtained from the U. S. Army Medical Museum, and the preparations obtained from both were in very close agreement. Furthermore, the same staining method has been used by several classes of students in bacteriology, University of Arkansas, using the typhoid germ and with the same results. Altogether, some fifty excellent preparations have been studied by the writer and several clear-cut microphotographs have been obtained.

From these studies the following conclusions are drawn. First, the number of flagella for each organism varies from one to several (rarely more than four), none showing as many as those figured in various texts, for example, Jordan's "General Bacteriology" (sixth edition), fig. 69, p. 299, or Migula's "System der Bakterien," vol. 1, pl. 2, fig. 6; vol. 2, pl. 7, fig. 6. Second, the arrangement of flagella is quite variable, often but a single polar flagellum is to be observed, occasionally one or more flagella appear at the sides, and not infrequently individuals occur having two flagella at one pole and with one or two at the sides. Third, there is a marked difference in the shape of the body as compared to those figured by various other investigators. In my preparations, the bodies appear very similar to those stained by ordinary, non-flagella staining methods, and compare very favorably to the figures presented by Migula, fig. 23, p. 727, vol. 2; fig. 6, pl. 7, vol. 2; or Jordan's fig. 68, p. 298. Indeed, if one carefully studies the figures given by these authors of *B. typhi*, stained by ordinary methods, and contrasts them with the figures given by these same authors, stained by flagella-staining methods, the conclusion is inevitable that either the flagella-staining methods have so distorted the shape of the organisms that they have no resemblance to the true forms, or that entirely different species are involved. The first explanation is probably the true one, for it is well known that many, if not all, of the older flagella-staining methods, such as Loeffler's or Van Ermengem's, possess a marked tendency to distort the bodies, and in addition, to deposit a more or less heavy precipitate on and around the bacteria. This last feature often renders it difficult to clearly delimit a single organism from a clump of organisms.

This has been almost entirely eliminated by the method used by the writer, as will be fully illustrated elsewhere. In all probability, then, the explanation for the difference in number and arrangement of flagella of *B. typhi* found by the writer and that given by various other writers is to be found in the degree of cleanness of preparations, particularly in freedom from deposits. In very few of the published photographs of *B. typhi* known to the writer can it be absolutely determined whether any one figure represents a single organism or a group of organisms. I am not overlooking the fact that there are other possible explanations, such as differences between strains in the number and arrangement of flagella, and that in making preparations it is very easy to destroy or render unobservable some or all of the flagella. However, the marked success in flagella staining and photographing that I have obtained with numerous and diverse organisms gives me a considerable degree of assurance that in the strains of *B. typhi* studied the flagella have been properly represented. In view of the importance of any method by which the typhoid fever germ may be accurately identified, the writer will be glad to lend preparations to others who may wish to make comparisons.

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